Nebraska-Western Iowa Health Care System - Omaha, NE

Statement of Work and Project Details

Repair Concrete and Asphalt Grand Island

636-12-115

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STATEMENT OF WORK

Repair Concrete and Asphalt
Grand Island, Nebraska 68
VA Nebraska-Western Iowa Health Care System
PROJECT #: 636-12-115

I. GENERAL SCOPE OF WORK: The work covered by this Statement of Work (SOW) consists of furnishing all labor, equipment, materials, travel, testing, and permits required to perform the work described herein.

A. **INTENT OF PROJECT:** The intent of this project is to renovate deteriorated areas of the driveways, sidewalks and parking areas at the Grand Island Division of the VA Nebraska-Western Iowa Health Care System. Repairs should be done in the most cost effective manner while taking pedestrians' safety into consideration.

B. **GENERAL DESCRIPTI0N:**
1. Demo specified concrete areas including: ramps, steps, slab sections, and curbing. Form and pour new sections where demo takes place.
2. Demo specified concrete slab sections and do not replace.
3. Form and pour concrete curbing in specified areas.
4. Grind down specified concrete areas where cracks, corrosion, spalling, and pot-holes occur. Patch with new concrete.
5. Caulk concrete slab sections and curbing in specified existing areas.
6. Use a mild acid solution and wash out existing concrete crazing in the specified areas.

II. REQUIRED SERVICES:
A. **SUBMITTALS:** The following shall be submitted to the contracting officer for review:
1. Written Asphalt Concrete (AC) mix design to show stability, density, aggregate size and percentages.
2. Written summary of all tests, inspections and results conducted by the general or subcontractors.

B. **PERMITS:** Contractor is responsible for all necessary permits at no additional cost to the government.

C. **TESTING, INSPECTION AND APPROVAL:** Contractor is responsible for all necessary testing, inspections and approvals required by local enforcing authorities and in accordance with Construction Specification Institute's master specifications in order to produce a warranted product without additional cost to the government.

D. **CONSTRUCTION PERFORMANCE STANDARD**: Contractor is solely responsible for construction quality that will result in a final product meeting the following conditions:
1. Standard one-year contractor's warranty as administered by this contract.
2. Additionally, no visible standing water on the paved surfaces or in storm drains during this period.
3. No elevation differences or changes greater than three inches (3") measured over any linear dimension of ten feet (10') during a period of 3 years.

III. ESSENTIAL REFRENCES:
A. Attached site plan and locations of individual projects. As well as estimates of work to be completed (See attached.)
B. All applicable city, state and national codes and standards shall be followed to include, but not limited to:
1. International Building Code, All Chapters.
2. City of Grand Island, Department of Transportation Standards, All Sections.

C. Points of Contact

1. VA Hospital – Facilities Projects Supervisor, Alan Maier, Omaha, NE; 402.995.4737; alan.maier@va.gov
2. VA Hospital – Facilities Engineering Technician, Kevin Hutsell, Grand Island, NE; 308.389-5168; kevin.hutsell@va.gov
3. VA Hospital – Contracting Officer, Gregg Sutcliffe, Omaha, NE; 402.995.4527; gregg.sutcliffe@va.gov

PROJECT DETAILS

I. Concrete Replacement:

A. Designated Areas for Roadway Line Items 0001-0005 and 0011-0013: (See drawing for site designation)
- L/I 0001 - Access Roads off of Wheeler Ave. which serves building 1 and includes loading dock area.
- L/I 0002 - North entrance loop off building 1. To include parking stalls and handicap ramp.
- L/I 0003 - Southeast parking lot off of building 1 with service to Mobil MRI trailer. Includes parking stalls.
- L/I 0004 - Maintenance access roads which serve buildings 6, 7, & 8. Includes parking lot between building 6, 7 & 8.
- L/I 0005 - Southwest entrance loop drive off building 1 with access roads to Broadwell Street (S.U. Hwy 281) and main patient parking lot.
- L/I 0011 - Southeast entrance loop off building 1. To include access road to main patient parking lot.
- L/I 0012 - Access Roads off of Wheeler Ave. which serves building 5. To include parking stalls to the east of building 5
- L/I 0013 - Access Roads off of Wheeler Ave. which serves buildings 2,3,4,10 & 11. To include parking stalls.

B. General Work to be performed for Roadway Line Items #0001-0005 and 0011-0013.
1. Demo and remove existing roadway.
2. Demo and remove existing curb and gutter.
3. Prep area for new roadway in accordance with all Government, State, local and VHA specifications.
4. Form and pour designated curb and gutter. Include all ADA ramps as required.
5. Form and pour designated roadway to a minimum depth of 8 inches.
6. Remove all construction debris
7. Prepare disturbed soil for sod.
8. Place new sod.
9. Place concrete sealant on all new concrete.
10. Paint centerline and curbing

II. Sidewalk Replacement and Additions:

A. Designated Areas for sidewalk Line Items #0007 - 0010: (See drawing for site designation)
- L/I 0007 - Two sidewalks leading from parking lot between buildings 6, 7, & 8 to access roadway.
- L/I 0008 - All side walk leading from main patient parking area to building 1.
- L/I 0009 - Sidewalk leading form Southwest entrance loop to walking path.
- L/I 0010 - All sidewalks in front of and between building 3 & 4 (to include sidewalk between parking stalls).

B. General Work to be performed for Sidewalk Line Items #0007 - 0010.
1. Demo and remove existing sidewalks.
2. Prep area for new sidewalk in accordance with all Government, State, local and VHA specifications.
3. Form and pour designated sidewalk with a minimum width of six feet and a minimum 5 ½" thickness unless otherwise specified. Include all ADA ramps as required.
4. Remove all construction debris
5. Prepare disturbed soil for sod.
6. Place new sod.
7. Place concrete sealant on all new concrete.

III. Asphalt:

A. Designated Areas for Asphalt Line Item #0015: (See drawing for site designation)
   1. Asphalt Parking lot

B. General Work to be performed for Asphalt Line Item #0015:
   1. Prepare designated parking lot for Asphalt topping to include grading and compacting of existing site in accordance with all Government, State, local and VHA specifications.
   2. Place 6" asphalt topping to parking lot. No more than 2" thickness for and lift of asphalt.
   3. Form and pour designated curb and gutter. Include all ADA ramps as required.
   4. Form and pour designated parking area.
   5. Remove all construction debris
   6. Prepare disturbed soil for sod.
   7. Place new sod.
   8. Paint parking stalls. Include all required ADA signage.

IV. Special Items:

A. Designated Areas for Special Line Items #0006, 0014 and 0016: (See drawing for site designation)
   1. Sidewalks, stairs, and ramps which serves the east entrance into building 6.
   2. Sidewalks, stairs, landings and ramps which serve the west main entrances into building 1.
   3. Place new sidewalk and patio from medical center entrance to new smoking shelter area.

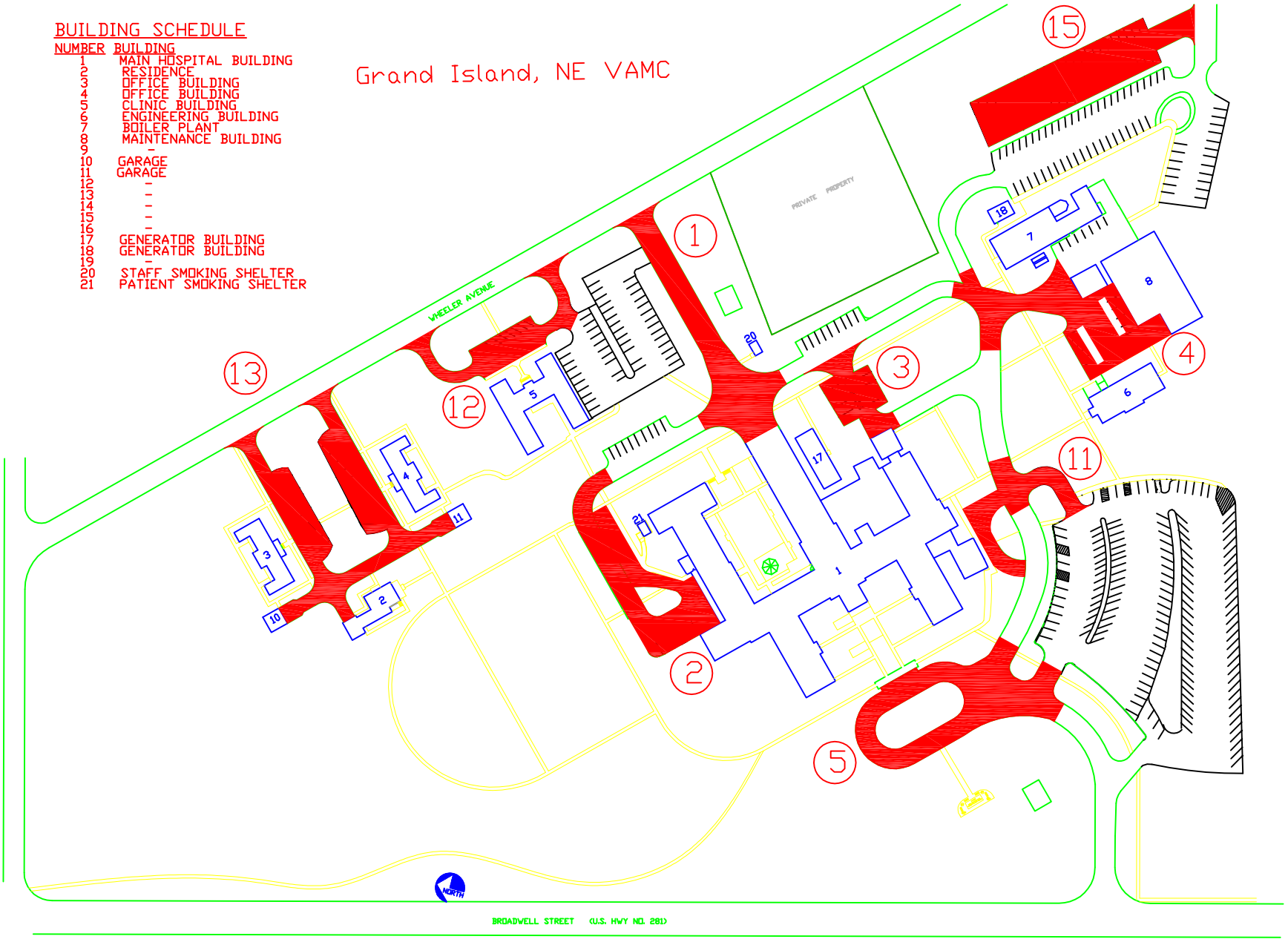
B. General Work to be performed for Special Line Items # 0006 and 0014.
   1. Demo and remove existing sidewalks, stairs, landings, and ramps.
   2. Demo and remove all existing handrails.
   3. Prep area for new sidewalk, stairs, landings and ADA ramps in accordance with all Government, State, local and VHA specifications.
   4. Form designated sidewalks, ramps and landings with a minimum width of six feet and a minimum 5 ½" thickness unless otherwise specified. Include reinforcing steel in all stairs and landings as required by VHA, Government, State, or local authorities having jurisdiction. Have form work approved prior to pouring concrete.
   5. Pour designated sidewalks, ramps, and landings.
   6. Place new handrails in accordance with all Government, State, local and VHA specifications.
   7. Remove all construction debris
   8. Prepare disturbed soil for sod.
   9. Place new sod.
   10. Place concrete sealant on all new concrete.

C. General Work to be performed for Special Line Item # 0016.
   1. Prep area for new sidewalk in accordance with all Government, State, local and VHA specifications.
   2. Form and pour designated sidewalk and patio with a minimum 5 ½" thickness unless otherwise specified.
   3. Form and pour concrete.
   4. Remove all construction debris
   5. Prepare disturbed soil for sod.
   6. Place new sod.
   7. Place concrete sealant on all new concrete.

Grand Island, NE VAMC

BUILDING SCHEDULE

NUMBER	BUILDING
1	MAIN HOSPITAL BUILDING
2	RESIDENCE
3	OFFICE BUILDING
4	OFFICE BUILDING
5	CLINIC BUILDING
6	ENGINEERING BUILDING
7	BOILER PLANT
8	MAINTENANCE BUILDING
9	–
10	GARAGE
11	GARAGE
12	–
13	–
14	–
15	–
16	–
17	GENERATOR BUILDING
18	GENERATOR BUILDING
19	–
20	STAFF SMOKING SHELTER
21	PATIENT SMOKING SHELTER



BUILDING SCHEDULE

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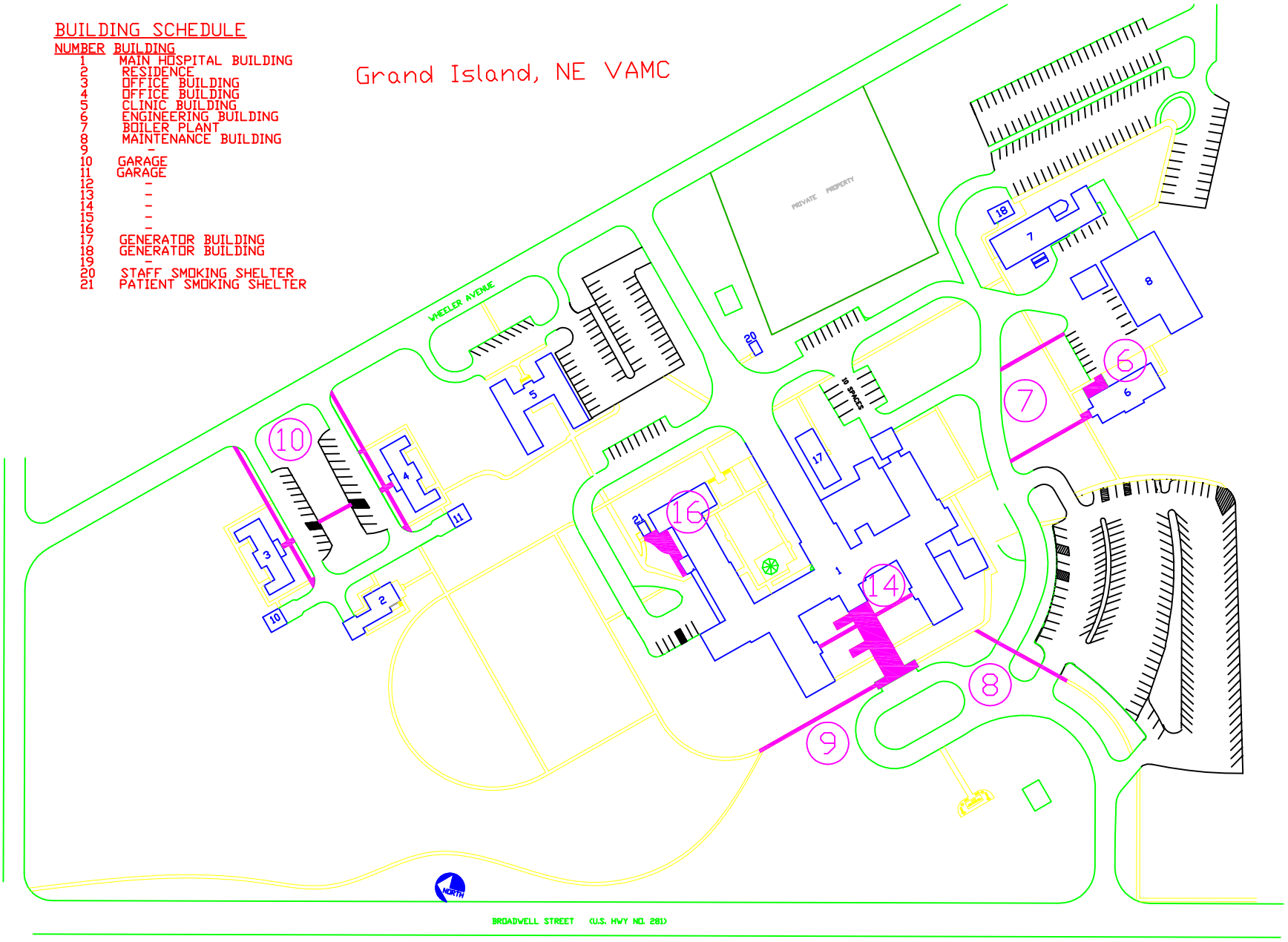
6	ENGINEERING BUILDING
7	BOILER PLANT
8	MAINTENANCE BUILDING
9	-
10	GARAGE
11	GARAGE
12	-
13	-
14	-
15	-
16	-
17	GENERATOR BUILDING
18	GENERATOR BUILDING
19	-
20	STAFF SMOKING SHELTER
21	PATIENT SMOKING SHELTER

Grand Island, NE VAMC



SECTION 01340

SAMPLES AND SHOP DRAWINGS

PART I – GENERAL

1-1. Refer to article 1.54 titled "Specifications and Drawings for Construction" (FAR 52.236-21) in Section 01001, General Conditions.

1-2. For the purposes of this contract, samples, laboratory samples to be tested, test reports, certificates, and manufacturers' literature and data shall also be subject to the previously referenced requirements. The following text refers to all such items collectively as "submittals".

1-3. Submit for approval, all of the items specifically mentioned under the separate sections of specification, with information sufficient to evidence full compliance with contract requirements. Materials, fabricated articles and the like to be installed in permanent work shall equal those of approved submittals. After an item has been approved, no change in brand or make will be permitted unless:

A. Satisfactory written evidence is presented to and approved by Contracting Officer that manufacturer cannot make scheduled delivery of approved item or;

B. Item delivered has been rejected and substitution of a suitable item is an urgent necessity or;

C. Other conditions become apparent which indicates approval of such substitute item to be in best interest of Government.

1-4. Forward submittals in sufficient time to permit proper consideration and approval action by Government. Time submissions to assure adequate lead time for procurement of contract-required items. Delays attributable to untimely and rejected submittals (including any laboratory samples to be tested) will not serve as a basis for extending contract time for completion.

1-5. Samples, shop drawings, certificates and manufacturers' literature and data will be reviewed for compliance with the contract requirements and action thereon will be taken by the COTR on behalf of the Contracting Officer.

1-6. Upon receipt of submittals, the Veterans Administration will assign a file number thereto. Contractor, in any subsequent correspondence, shall refer to this file and identification number to expedite replies relative to previously approved or disapproved submittals.

1-7. The Government reserves the right to require submission of samples, certificates, literature, data, schedules and details, and shop, erection or setting drawings whether or not particularly mentioned herein. If additional submittals beyond those required by contract are furnished pursuant to request therefore by Contracting Officer, adjustment in contract price and time will be made in accordance with clause entitled "Changes" (FAR 52.243-4) and "Changes - Supplement" (VAAR 852.236-88) of Section 01001, General Conditions.

1-8. Schedules called for in specifications and shown on shop drawings shall be submitted for use and information of Contracting Officer. However, Contractor shall assume responsibility for coordinating and verifying schedules. Contracting Officer assumes no responsibility for checking schedules or layout drawings for exact sizes, exact numbers and detailed positioning of items.

1-9. Submittals must be submitted by Contractor only and shipped prepaid. Contracting officer assumes no responsibility for checking quantities or exact numbers included in submittals.

A. Submit samples in single units unless otherwise specified. Submit shop drawings, schedules, certificates and manufacturers' literature and data in quadruplicate, except where a greater number is specified.

B. Submittals will receive consideration only when covered by a transmittal letter signed by Contractor. Letter shall be sent via first-class mail and shall contain the list of items, name of Station, name of Contractor, contract number, applicable specification paragraph numbers, applicable drawing numbers (and other information required for exact identification of location for each item), manufacturer and brand, ASTM or Federal Specification Number (if any) and such additional information as may be required by specifications for particular item being furnished. In addition, catalogs shall be marked to indicate specific items submitted for approval.

1. A copy of letter must be enclosed with items, and any items received without identification letter will be considered "unclaimed goods" and held for a limited time only.
2. Each sample, certificate, manufacturer's literature and data shall be labeled to indicate the name of the medical center, name of Contractor, manufacturer, brand, contract

number and ASTM or Federal Specification Number as applicable and location(s) on project.

3. Required certificates shall be signed by an authorized representative of manufacturer or supplier of material, and by Contractor.

C. If submittal samples have been disapproved, resubmit new samples as soon as possible after notification of disapproval. Such new samples shall be marked "Resubmitted Sample" in addition to containing other previously specified information required on label and in transmittal letter.

D. Approved samples will be kept on file by COTR at site until completion of contract, at which time such samples will be delivered to Contractor as Contractor's property. Where noted in technical sections of specifications, approved samples in good condition may be used in their proper locations in contract work. At completion of contract, samples that are not approved will be returned to Contractor only upon request and at Contractor's expense. Disapproved samples that are not requested for return by Contractor will be discarded after completion of contract.

E. Submittal drawings (shop, erection or setting drawings) and schedules, required for work of various trades, shall be checked before submission by technically qualified employees of Contractor for accuracy, completeness and compliance with contract requirements. These drawings shall be stamped and signed by Contractor certifying to such check.

1. Each drawing shall have marked thereon, proper descriptive title, including station location, project number, manufacturer's number, reference to contract drawing numbers, detail Section Number and Specification Section Number.
2. A space 4-3/4 by 5 inches shall be reserved on each drawing to accommodate approval or disapproval stamp.
3. Submit drawings, rolled within a mailing tube, fully protected for shipment.
4. One reproducible print of approved and disapproved shop drawings will be forwarded to Contractor.

5. When work is directly related and involves more than one trade, shop drawings shall be submitted to Veterans Administration under one cover.

1-10. Submit samples (except laboratory samples), shop drawings, test reports, certificates and manufacturers' literature and data, as required by individual sections of the specification, for approval to the attention of the COTR, Engineering Service, VA Medical Center, 4101 Woolworth Avenue, Omaha, Nebraska 68105.

- - - END OF SECTION 01340 - - -

SECTION 01410 TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies materials testing and inspection during construction provided by a Testing Laboratory, retained and paid for by the Contractor.

1.2 REQUIREMENTS

A. The Testing Laboratory shall inspect the materials and workmanship and perform the tests described herein and additional tests requested by the Resident Engineer. When it appears that the materials furnished, or work performed by the Contractor fail to meet the construction contract requirements, the Testing Laboratory shall direct the attention of the Resident Engineer to such failure.

B. Written Reports: Submit all test reports to Resident Engineer within 24 hours after each test is completed.

C. Verbal Reports: Testing Laboratory is to give verbal notification to Resident Engineer immediately of any irregularity.

D. Test Standards: Testing Laboratory shall furnish the Resident Engineer one copy of each standard (ASTM, AASHTO, ACI and AWS) referred to or which is pertinent to these specifications.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EARTHWORK – NOT IN CONTRACT

3.2 LANDSCAPING – NOT IN CONTRACT

3.3 ASPHALT CONCRETE PAVING

A. Asphalt Concrete:

1. Aggregate: Sample and test aggregates in stock pile and hot-bins as necessary to insure compliance with specification requirements for gradation and quality.
2. Temperature: Check temperature of each load of asphalt concrete at mixing plant and at site of paving operation.
3. Density: Make a minimum of two field density tests and comparative 50-blow Marshall tests of asphalt base and surface course for each day's paving operation.

- - - END OF SECTION 01410 - - -

SECTION 01420

REFERENCES

PART I - GENERAL

1.1 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": The term "approved," when used to convey Designer's action on Contractor's submittals, applications, and requests, is limited to Designer's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by Designer, requested by Designer, and similar phrases.

D. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on Drawings or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference.

E. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": The term "furnish" means to supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": The term "install" describes operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": The term "Provide" means to furnish and install, complete and ready for the intended use.

I. "Installer": An installer is the Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

J. The term "experienced," when used with an entity, means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special

requirements indicated; and having complied with requirements of authorities having jurisdiction.

1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades people of the corresponding generic name.

K. "Project site" is the space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Design/Builder for a decision before proceeding.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Design/Builder for a decision before proceeding.

C. Copies of Standards: Each entity engaged in construction on Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source and make them available on request.

E. Abbreviations and Acronyms for Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

- - - END OF SECTION 01420- - -

SECTION 01568

ENVIRONMENTAL PROTECTION

EP-1. DESCRIPTION

A. This section specifies the control of environmental pollution and damage that the Contractor must consider for air, water, and land resources. It includes management of visual aesthetics, noise, solid waste, radiant energy, and radioactive materials, as well as other pollutants and resources encountered or generated by the Contractor. The Contractor is obligated to consider specified control measures with the costs included within the various contract items of work.

B. Environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which:

1. Adversely effect human health or welfare,
2. Unfavorably alter ecological balances of importance to human life,
3. Effect other species of importance to humankind, or;
4. Degrade the utility of the environment for aesthetic, cultural, and historical purposes.

C. Definitions of Pollutants:

1. Chemical Waste: Petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals, and inorganic wastes.
2. Debris: Combustible and noncombustible wastes, such as leaves, tree trimmings, ashes, and waste materials resulting from construction or maintenance and repair work.
3. Sediment: Soil and other debris that has been eroded and transported by runoff water.
4. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial, and agricultural operations and from community activities.
5. Surface Discharge: The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "water of the United States" and would require a permit to discharge water from the governing agency.

6. Rubbish: Combustible and noncombustible wastes such as paper, boxes, glass and crockery, metal and lumber scrap, tin cans, and bones.
7. Sanitary Wastes:
   a. Sewage: Domestic sanitary sewage and human and animal waste.
   b. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

EP-2. QUALITY CONTROL

A. Establish and maintain quality control for the environmental protection of all items set forth herein.

B. Record on daily reports any problems in complying with laws, regulations, and ordinances. Note any corrective action taken.

EP-3. REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

B. U.S. National Archives and Records Administration (NARA):
33 CFR 328.....Definitions

EP-4. SUBMITTALS

A. In accordance with Section, 01340, SAMPLES AND SHOP DRAWINGS, furnish the following:

1. Environmental Protection Plan: After the contract is awarded and prior to the commencement of the work, the Contractor shall meet with the Resident Engineer to discuss the proposed Environmental Protection Plan and to develop mutual understanding relative to details of environmental protection. Not more than 20 days after the meeting, the Contractor shall prepare and submit to the Resident Engineer and the Contracting Officer for approval, a written and/or graphic Environmental Protection Plan including, but not limited to, the following:
   a. Name(s) of person(s) within the Contractor's organization who is (are) responsible for ensuring adherence to the Environmental Protection Plan.
   b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site.
   C. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
   d. Description of the Contractor's environmental protection personnel training program.

e. A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control, noise control and abatement that are applicable to the Contractor's proposed operations and the requirements imposed by those laws, regulations, and permits.

f. Methods for protection of features to be preserved within authorized work areas including trees, shrubs, vines, grasses, ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, and archeological and cultural resources.

g. Procedures to provide the environmental protection that comply with the applicable laws and regulations. Describe the procedures to correct pollution of the environment due to accident, natural causes, or failure to follow the procedures as described in the Environmental Protection Plan.

h. Permits, licenses, and the location of the solid waste disposal area.

i. Drawings showing locations of any proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials. Include as part of an Erosion Control Plan approved by the District Office of the U.S. Soil Conservation Service and the Department of Veterans Affairs.

j. Environmental Monitoring Plans for the job site including land, water, air, and noise.

k. Work Area Plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas. This plan may be incorporated within the Erosion Control Plan.

B. Approval of the Contractor's Environmental Protection Plan will not relieve the Contractor of responsibility for adequate and continued control of pollutants and other environmental protection measures.

EP-5. PROTECTION OF ENVIRONMENTAL RESOURCES

A. Protect environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire period of this contract. Confine activities to areas defined by the specifications and drawings.

B. Protection of Land Resources: Prior to construction, identify all land resources to be preserved within the work area. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, top soil, and land forms without permission from the Resident Engineer. Do not fasten or attach ropes, cables, or guys to trees for anchorage unless specifically authorized, or where special emergency use is permitted.

1. Work Area Limits: Prior to any construction, mark the areas that require work to be performed under this contract. Mark or fence isolated areas within the general work area that are to be saved and protected. Protect monuments, works of art, and markers before construction operations begin. Convey to all personnel the purpose of marking and protecting all necessary objects.
2. Protection of Landscape: Protect trees, shrubs, vines, grasses, land forms, and other landscape features shown on the drawings to be preserved by marking, fencing, or using any other approved techniques.
    a. Box and protect from damage existing trees and shrubs to remain on the construction site.
    b. Immediately repair all damage to existing trees and shrubs by trimming, cleaning, and painting with antiseptic tree paint.
    c. Do not store building materials or perform construction activities closer to existing trees or shrubs than the farthest extension of their limbs.
3. Reduction of Exposure of Unprotected Erodible Soils: Plan and conduct earthwork to minimize the duration of exposure of unprotected soils. Clear areas in reasonably sized increments only as needed to use. Form earthwork to final grade as shown. Immediately protect side slopes and back slopes upon completion of rough grading.
4. Temporary Protection of Disturbed Areas: Construct diversion ditches, benches, and berms to retard and divert runoff from the construction site to protected drainage areas approved under paragraph 208 of the Clean Water Act.
    a. Institute effluent quality monitoring programs as required by Federal, State, and local environmental agencies.
5. Erosion and Sedimentation Control Devices: The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result

of the Contractor's activities. Construct or install all temporary and permanent erosion and sedimentation control features. Maintain temporary erosion and sediment control measures such as berms, dikes, drains, sedimentation basins, grassing, and mulching, until permanent drainage and erosion control facilities are completed and operative.

6. Manage borrow areas on Government property to minimize erosion and to prevent sediment from entering nearby water courses or lakes.
7. Manage and control spoil areas on Government property to limit spoil to areas and prevent erosion of soil or sediment from entering nearby water courses or lakes.
8. Protect adjacent areas from despoilment by temporary excavations and embankments.
9. Handle and dispose of solid wastes in such a manner that will prevent contamination of the environment. Place solid wastes (excluding clearing debris) in containers that are emptied on a regular schedule. Transport all solid waste off Government property and dispose of waste in compliance with Federal, State, and local requirements.
10. Store chemical waste away from the work areas in corrosion resistant containers and dispose of waste in accordance with Federal, State, and local regulations.
11. Handle discarded materials other than those included in the solid waste category as directed by the Resident Engineer.

C. Protection of Water Resources: Keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters and sewer systems. Implement management techniques to control water pollution by the listed construction activities that are included in this contract.

1. Washing and Curing Water: Do not allow wastewater directly derived from construction activities to enter water areas. Collect and place wastewater in retention ponds allowing the suspended material to settle, the pollutants to separate, or the water to evaporate.
2. Control movement of materials and equipment at stream crossings during construction to prevent violation of water pollution control standards of the Federal, State, or local government.
3. Monitor water areas affected by construction.

D. Protection of Fish and Wildlife Resources: Keep construction activities under surveillance, management, and control to minimize interference with, disturbance of, or damage to fish and wildlife. Prior to beginning construction operations, list species that require specific attention along with measures for their protection.

E. Protection of Air Resources: Keep construction activities under surveillance, management, and control to minimize pollution of air resources. Burning is not permitted on the job site. Keep activities, equipment, processes, and work operated or performed, in strict accordance with the State of Nebraska and Federal emission and performance laws and standards. Maintain ambient air quality standards set by the Environmental Protection Agency, for those construction operations and activities specified.

   1. Particulates: Control dust particles, aerosols, and gaseous by-products from all construction activities, processing, and preparation of materials (such as from asphaltic batch plants) at all times, including weekends, holidays, and hours when work is not in progress.
   2. Particulates Control: Maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and all other work areas within or outside the project boundaries free from particulates which would cause a hazard or a nuisance. Sprinklering, chemical treatment of an approved type, light bituminous treatment, baghouse, scrubbers, electrostatic precipitators, or other methods are permitted to control particulates in the work area.
   3. Hydrocarbons and Carbon Monoxide: Control monoxide emissions from equipment to Federal and State allowable limits.
   4. Odors: Control odors of construction activities and prevent obnoxious odors from occurring.

F. Reduction of Noise: Minimize noise using every action possible. Perform noise-producing work in less sensitive hours of the day or week as directed by the Resident Engineer. Maintain noise-produced work at or below the decibel levels and within the time periods specified.

   1. Perform construction activities involving repetitive, high-level impact noise only between 7:00a.m. and 5:00p.m unless otherwise permitted by local ordinance or the Resident Engineer. Repetitive

impact noise on the property shall not exceed the following dB limitations:

Time Duration of Impact Noise	Sound Level in dB
More than 12 minutes in any hour	70
Less than 30 seconds of any hour	85
Less than three minutes of any hour	80
Less than 12 minutes of any hour	75

2. Provide sound-deadening devices on equipment and take noise abatement measures that are necessary to comply with the requirements of this contract, consisting of, but not limited to, the following:
   a. Maintain maximum permissible construction equipment noise levels at 15 m (50 feet) (dBA):

EARTHMOVING		MATERIALS HANDLING	
FRONT LOADERS	75	CONCRETE MIXERS	75
BACKHOES	75	CONCRETE PUMPS	75
DOZERS	75	CRANES	75
TRACTORS	75	DERRICKS IMPACT	75
SCAPERS	80	PILE DRIVERS	95
GRADERS	75	JACK HAMMERS	75
TRUCKS	75	ROCK DRILLS	80
PAVERS,	80	PNEUMATIC TOOLS	80
STATIONARY			
PUMPS	75	BLASTING	Not Used
GENERATORS	75	SAWS	75
COMPRESSORS	75	VIBRATORS	75

   b. Use shields or other physical barriers to restrict noise transmission.
   c. Provide soundproof housings or enclosures for noise-producing machinery.
   d. Use efficient silencers on equipment air intakes.
   e. Use efficient intake and exhaust mufflers on internal combustion engines that are maintained so equipment performs below noise levels specified.
   f. Line hoppers and storage bins with sound deadening material.
   g. Conduct truck loading, unloading, and hauling operations so that noise is kept to a minimum.
3. Measure sound level for noise exposure due to the construction at least once every five successive working days while work is being

performed above 55 dB(A) noise level. Measure noise exposure at the property line or 15 m (50 feet) from the noise source, whichever is greater. Measure the sound levels on the A weighing network of a General Purpose sound level meter at slow response. To minimize the effect of reflective sound waves at buildings, take measurements at 900 to 1800 mm (three to six feet) in front of any building face. Submit the recorded information to the Resident Engineer noting any problems and the alternatives for mitigating actions.

G. Restoration of Damaged Property: If any direct or indirect damage is done to public or private property resulting from any act, omission, neglect, or misconduct, the Contractor shall restore the damaged property to a condition equal to that existing before the damage at no additional cost to the Government. Repair, rebuild, or restore property as directed or make good such damage in an acceptable manner.

H. Final Clean-up: On completion of project and after removal of all debris, rubbish, and temporary construction, Contractor shall leave the construction area in a clean condition satisfactory to the Resident Engineer. Cleaning shall include off the station disposal of all items and materials not required to be salvaged, as well as all debris and rubbish resulting from demolition and new work operations.

- - - END OF SECTION 01568 - - -

SECTION 01732

SELECTIVE DEMOLITION

PART I-GENERAL

1.1 SUMMARY

A. This Section includes demolition and removal of the following:
   1) Existing asphalt pavement that will be recycled and relayed in this project
   2) Existing concrete pavement to be removed in this project.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and deliver them to Owner.

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from the project site.

1.4 SUBMITTALS

A. Proposed Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate. Include measures for the following:
   1. Dust control.
   2. Noise control.

B. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.

1.5 QUALITY ASSURANCE

A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Standards: Comply with ANSI A10.6 and NFPA 241.

1.6 PROJECT CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted. Provide not less than 72 hours' notice to COTR that will affect Owner's operations.

B. Maintain access to existing walkways and other adjacent occupied or used facilities.

1. Do not close or obstruct walkways, or other occupied or used facilities without written permission from authorities having jurisdiction.

C. Owner assumes no responsibility for condition of areas to be selectively demolished.

1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

D. Storage or sale of removed items or materials on-site will not be permitted.

E. Utility Service: Maintain existing utilities indicated to remain In service and protect them against damage during selective demolition operations.

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

A. Use repair materials identical to existing materials.

1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

B. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to COTR.

3.2 UTILITY SERVICES

A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.

B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction. Provide at least 5 days notice to Owner if shutdown of service is required during changeover.

C. Utility Requirements: Locate and identify utilities serving areas to be selectively demolished.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or use facilities without permission from facility coordinator.
2. Provide alternate routes around closed or obstructed walk ways.
3. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways where required by authorities having jurisdiction.
4. Protect existing site improvements, appurtenances, and landscaping to remain.

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to facilities to remain.

3.4 POLLUTION CONTROLS

A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.

B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

3.5 SELECTIVE DEMOLITION

A. General: Demolish and remove existing areas only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations.

3.6 PATCHING AND REPAIRS

A. General: Promptly repair damage to adjacent areas caused by selective demolition operations.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

- - - END OF SECTION 01732 ---

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

A. This section specifies the requirements for furnishing all equipment, materials, labor, tools, and techniques for earthwork including, but not limited to, the following:
   1. Site preparation.
   2. Excavation.
   3. Filling and backfilling.
   4. Grading.
   5. Soil Disposal.
   6. Clean Up.

1.2 DEFINITIONS:

A. Unsuitable Materials:
   1. Fills: Topsoil; frozen materials; construction materials and materials subject to decomposition; clods of clay and stones larger than 75 mm (3 inches); organic material, including silts, which are unstable; and inorganic materials, including silts, too wet to be stable and any material with a liquid limit and plasticity index exceeding 40 and 15 respectively. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction, as defined by AASHTO T 99.
   2. Existing Subgrade (Except Footing Subgrade): Same materials as 1.2.A.1, that are not capable of direct support of slabs, pavement, and similar items with possible exception of improvement by compaction, proofrolling, or similar methods.

B. Building Earthwork: Earthwork operations required in area enclosed by a line located 1500 mm (5 feet) outside of principal building perimeter. It also includes earthwork required for auxiliary structures and buildings.

C. Trench Earthwork: Trenchwork required for utility lines.

D. Site Earthwork: Earthwork operations required in area outside of a line located 1500 mm (5 feet) outside of principal building perimeter and within new construction area with exceptions noted above.

E. Degree of compaction: Degree of compaction is expressed as a percentage of maximum density obtained by laboratory test procedure. This percentage of maximum density is obtained through use of data provided from results of field test procedures presented in ASTM D1556, ASTM D2167, and ASTM D2922.

F. Fill: Satisfactory soil materials used to raise existing grades. In the Construction Documents, the term “fill” means fill or backfill as appropriate.

G. Backfill: Soil materials or controlled low strength material used to fill an excavation.

H. Unauthorized excavation: Removal of materials beyond indicated sub-grade elevations or indicated lines and dimensions without written authorization by the Resident Engineer. No payment will be made for unauthorized excavation or remedial work required to correct unauthorized excavation.

I. Authorized additional excavation: Removal of additional material authorized by the Resident Engineer based on the determination by the Government’s soils testing agency that unsuitable bearing materials are encountered at required sub-grade elevations. Removal of unsuitable material and its replacement as directed will be paid on basis of Conditions of the Contract relative to changes in work.

J. Subgrade: The undisturbed earth or the compacted soil layer immediately below granular sub-base, drainage fill, or topsoil materials.

K. Structure: Buildings, foundations, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

L. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.

M. Drainage course: Layer supporting slab-on-grade used to minimize capillary flow of pore water.

N. Bedding course: Layer placed over the excavated sub-grade in a trench before laying pipe. Bedding course shall extend up to the springline of the pipe.

O. Sub-base Course: Layer placed between the sub-grade and base course for asphalt paving or layer placed between the sub-grade and a concrete pavement or walk.

P. Utilities include on-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

Q. Debris: Debris includes all materials located within the designated work area not covered in the other definitions and shall include but not be limited to items like vehicles, equipment, appliances, building materials or remains thereof, tires, any solid or liquid chemicals or products stored or found in containers or spilled on the ground.

R. Contaminated soils: Soil that contains contaminates as defined and determined by the Resident Engineer or the Government's testing agency.

1.3 RELATED WORK:

A. Materials testing and inspection during construction: Section 01410, TESTING LABORATORY SERVICES.

B. Safety requirements: Section 01001, GENERAL CONDITIONS, Article, ACCIDENT PREVENTION.

C. Protection of existing utilities, fire protection services, existing equipment, roads, and pavements: Section 01010, GENERAL REQUIREMENTS.

D. Subsurface Investigation: Section 01010, GENERAL REQUIREMENTS, Article, PHYSICAL DATA.

E. Erosion Control: Section 01568, ENVIRONMENTAL PROTECTION, and Section 02480, LANDSCAPING.

F. Paving sub-grade requirements: Section 02513, ASPHALTIC CONCRETE PAVING.

1.4 CLASSIFICATION OF EXCAVATION:

A. Unclassified Excavation: Removal and disposal of pavements and other man-made obstructions visible on surface; utilities, and other items including underground structures indicated to be demolished and removed; together with any type of materials regardless of character of material and obstructions encountered.

1.5 MEASUREMENT AND PAYMENT FOR ROCK EXCAVATION: (NOT USED)

1.6 SUBMITTALS:

A. Submit in accordance with Section 01340, SAMPLES AND SHOP DRAWINGS.

B. Furnish to Resident Engineer:

1. Contactor shall furnish resumes with all personnel involved in the project including Project Manager, Superintendent, and on-site Engineer. Project Manager and Superintendent should have at least 3 years of experience on projects of similar size.
2. Soil samples.

a. Classification in accordance with ASTM D2487 for each on-site or borrow soil material proposed for fill, backfill, engineered fill, or structural fill.
b. Laboratory compaction curve in accordance with AASHTO T 99 for each on site or borrow soil material proposed for fill, backfill, engineered fill, or structural fill.
c. Test reports for compliance with ASTM D 2940 requirements for subbase material.
d. Pre-excavation photographs and videotape in the vicinity of the existing structures to document existing site features, including surfaces finishes, cracks, or other structural blemishes that might be misconstrued as damage caused by earthwork operations.
e. The Contractor shall submit a scale plan daily that defines the location, limits, and depths of the area excavated.

1.7 APPLICABLE PUBLICATIONS:

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. American Association of State Highway and Transportation Officials (AASHTO):

T99-01(2004).....Moisture-Density Relations of Soils Using a 2.5 kg (5.5 lb) Rammer and a 305 mm (12 inch) Drop

C. American Society for Testing and Materials (ASTM):

D448-03a.....Standard Classification for Sizes of Aggregate for Road and Bridge Construction

D1556-00.....Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

D2167-94 (2001).....Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method

D2487-06.....Standard Classification of Soil for Engineering Purposes (Unified Soil Classification System)

D2922-05.....Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

D2940-03.....Standard Specifications for Graded Aggregate Material for Bases or Subbases for Highways or Airports

D. Society of Automotive Engineers (SAE):

J732-92.....Specification Definitions - Loaders

J1179-02.....Hydraulic Excavator and Backhoe Digging Forces

PART 2 - PRODUCTS

2.1 MATERIALS:

A. General: Provide borrow soil material when sufficient satisfactory soil materials are not available from excavations.

B. Fills: Material in compliance with ASTM D2487 Soil Classification Groups GW, GP, GM, SW, SP, SM, SC, and ML, or any combination of these groups; free of rock or gravel larger than 75 mm (3 inches) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter. Material approved from on site or off site sources having a minimum dry density of 1760 kg/m3 (110 pcf), a maximum Plasticity Index of 15, and a maximum Liquid Limit of 40.

C. Engineered Fill: Naturally or artificially graded mixture of compliance with ASTM D2487 Soil Classification Groups GW, GP, GM, SW, SP, SM, SC, and ML, or any combination of these groups, or as approved by the Engineer or material with at least 90 percent passing a 37.5-mm (1 1/2-inch) sieve and not more than 12 percent passing a 75-µm (No. 200) sieve, per ASTM D2940;.

D. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940; except with 100 percent passing a 25 mm (1 inch) sieve and not more than 8 percent passing a 75-µm (No. 200) sieve.

E. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 37.5 mm (1 1/2-inch) sieve and 0 to 5 percent passing a 2.36 mm (No. 8) sieve.

F. Granular Fill:

1. Under concrete slab, crushed stone or gravel graded from 25 mm (1 inch) to 4.75 mm (No. 4), per ASTM D 2940.
2. Bedding for sanitary and storm sewer pipe, crushed stone or gravel graded from 13 mm (1/2 inch) to 4.75 mm (No 4), per ASTM D 2940.

PART 3 - EXECUTION

3.1 SITE PREPARATION:

A. Clearing: Clear within limits of earthwork operations as shown. Work includes removal of trees, shrubs, fences, foundations, incidental structures, paving, debris, trash, and other obstructions. Remove materials from Medical Center.

B. Grubbing: Remove stumps and roots 75 mm (3 inch) and larger diameter. Undisturbed sound stumps, roots up to 75 mm (3 inch) diameter, and nonperishable solid objects a minimum of 900 mm (3 feet) below sub-grade or finished embankment may be left.

C. Trees and Shrubs: Trees and shrubs, not shown for removal, may be removed from areas within 4500 mm (15 feet) of new construction and 2250 mm (7.5 feet) of utility lines when removal is approved in advance by Resident Engineer. Remove materials from Medical Center. Box, and otherwise protect from damage, existing trees and shrubs which are not shown to be removed in construction area. Immediately repair damage to existing trees and shrubs by trimming, cleaning and painting damaged areas, including roots, in accordance with standard industry horticultural practice for the geographic area and plant species. Do not store building materials closer to trees and shrubs, that are to remain, than farthest extension of their limbs.

D. Stripping Topsoil: Strip topsoil from within limits of earthwork operations as specified. Topsoil shall be a fertile, friable, natural topsoil of loamy character and characteristic of locality. Topsoil shall be capable of growing healthy horticultural crops of grasses. Stockpile topsoil and protect as directed by Resident Engineer. Eliminate foreign materials, such as weeds, roots, stones, subsoil, frozen clods, and similar foreign materials larger than 0.014 m3 (1/2 cubic foot) in volume, from soil as it is stockpiled. Retain topsoil on station. Remove foreign materials larger than 50 mm (2 inches) in any dimension from topsoil used in final grading. Topsoil work, such as stripping, stockpiling, and similar topsoil work shall not, under any circumstances, be carried out when soil is wet so that the composition of the soil will be destroyed.

E. Concrete Slabs and Paving: Score deeply or saw cut to insure a neat, straight cut, sections of existing concrete slabs and paving to be removed where excavation or trenching occurs. Extend pavement section to be removed a minimum of 300 mm (12 inches) on each side of widest part of trench excavation and insure final score lines are

approximately parallel unless otherwise indicated. Remove material from Medical Center.

F. Disposal: All materials removed from the property shall be disposed of at a legally approved site, for the specific materials, and all removals shall be in accordance with all applicable Federal, State and local regulations.

3.2 EXCAVATION:

A. Subgrade Protection: Protect subgrades from softening, undermining, washout, or damage by rain or water accumulation. Reroute surface water runoff from excavated areas and not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches. When subgrade for foundations has been disturbed by water, remove disturbed material to firm undisturbed material after water is brought under control. Replace disturbed subgrade in trenches with concrete or material approved by the Resident Engineer.

B. Blasting: Blasting of materials classified as rock shall not be permitted.

C. Proofrolling:

1. After rough grade has been established in cut areas and prior to placement of fill in fill areas under building and pavements, proofroll exposed subgrade with a fully loaded dump truck to check for pockets of soft material.
2. Proofrolling shall consist of at least two complete passes with one pass being in a direction perpendicular to preceding one. Remove any areas that deflect, rut, or pump excessively during proofrolling, or that fail to consolidate after successive passes to suitable soils and replaced with compacted fill. Maintain subgrade until succeeding operation has been accomplished.

D. Site Earthwork: Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation. Excavation shall be accomplished as required by drawings and specifications. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 25 mm (1 inch). Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, complying with OSHA requirements, and for inspections. Remove subgrade materials that are determined by Resident Engineer

as unsuitable, and replace with acceptable material. If there is a question as to whether material is unsuitable or not, the contractor shall obtain samples of the material, under the direction of the Resident Engineer, and the materials shall be examined by an independent testing laboratory for soil classification to determine whether it is unsuitable or not. When unsuitable material is encountered and removed, contract price and time will be adjusted in accordance with Articles, DIFFERING SITE CONDITIONS, CHANGES and CHANGES-SUPPLEMENT of the GENERAL CONDITIONS as applicable. Adjustments to be based on volume in cut section only.

1. Site Grading:
   a. Provide a smooth transition between adjacent existing grades and new grades.
   b. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
   c. Slope grades to direct water away from buildings and to prevent ponds from forming where not designed. Finish subgrades to required elevations within the following tolerances:
      1) Lawn or Unpaved Areas: Plus or minus 25 mm (1 inch).
      2) Walks: Plus or minus 25 mm (1 inch).
      3) Pavements: Plus or minus 13 mm (1 inch).

3.4 FILLING AND BACKFILLING:

A. General: Do not fill or backfill until all debris, water, unsatisfactory soil materials, obstructions, and deleterious materials have been removed from excavation. For fill and backfill, use excavated materials and borrow meeting the criteria specified herein, as applicable. Borrow will be supplied at no additional cost to the Government. Do not use unsuitable excavated materials. Do not backfill until foundation walls have been completed above grade and adequately braced, waterproofing or dampproofing applied, foundation drainage, and pipes coming in contact with backfill have been installed and work inspected and approved by Resident Engineer.

B. Placing: Place materials in horizontal layers not exceeding 200 mm (8 inches) in loose depth for material compacted by heavy compaction equipment, and not more than 100 mm (4 inches) in loose depth for material compacted by hand-operated tampers and then compacted. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each

structure. Place no material on surfaces that are muddy, frozen, or contain frost.

C. Compaction: Compact with approved tamping rollers, sheepsfoot rollers, pneumatic tired rollers, steel wheeled rollers, vibrator compactors, or other approved equipment (hand or mechanized) well suited to soil being compacted. Do not operate mechanized vibratory compaction equipment within 3000 mm (10 feet) of new or existing building walls without prior approval of Resident Engineer. Moisten or aerate material as necessary to provide moisture content that will readily facilitate obtaining specified compaction with equipment used. Compact soil to not less than the following percentages of maximum dry density, according to ASTM D698 or ASTM D1557 as specified below:

1. Fills, Embankments, and Backfill
   a. Under proposed structures, building slabs, steps, and paved areas, scarify and recompact top 300 mm (12 inches) of existing subgrade and each layer of backfill or fill material in accordance with AASHTO T99.
   b. Curbs, curbs and gutters, AASHTO T99.
   c. Under Sidewalks, scarify and recompact top 150 mm (6 inches) below subgrade and compact each layer of backfill or fill material in accordance with AASHTO T99.
   d. Landscaped areas, top 400 mm (16 inches), AASHTO T99.
2. Natural Ground (Cut or Existing)
   a. Under building slabs, steps and paved areas, top 150 mm (6 inches), AASHTO T99.
   b. Curbs, curbs and gutters, top 150 mm (6 inches), AASHTO T99.
   c. Under sidewalks, top 150 mm (6 inches), AASHTO T99.

3.5 GRADING:

A. General: Uniformly grade the areas within the limits of this section, including adjacent transition areas. Smooth the finished surface within specified tolerance. Provide uniform levels or slopes between points where elevations are indicated, or between such points and existing finished grades. Provide a smooth transition between abrupt changes in slope.

B. Cut rough or sloping rock to level beds for foundations. In pipe spaces or other unfinished areas, fill low spots and level off with coarse sand or fine gravel.

C. Slope backfill outside building away from building walls for a minimum distance of 1800 mm (6 feet).

D. Finish grade earth floors in pipe basements as shown to a level, uniform slope and leave clean.

E. Finished grade shall be at least 150 mm (6 inches) below bottom line of window or other building wall openings unless greater depth is shown.

F. Place crushed stone or gravel fill under concrete slabs on grade, tamped, and leveled. Thickness of fill shall be 150 mm (6 inches) unless otherwise shown.

G. Finish subgrade in a condition acceptable to Resident Engineer at least one day in advance of paving operations. Maintain finished subgrade in a smooth and compacted condition until succeeding operation has been accomplished. Scarify, compact, and grade subgrade prior to further construction when approved compacted subgrade is disturbed by Contractor's subsequent operations or adverse weather.

H. Grading for Paved Areas: Provide final grades for both subgrade and base course to +/- 6 mm (0.25 inches) of indicated grades.

3.6 DISPOSAL OF UNSUITABLE AND EXCESS EXCAVATED MATERIAL:

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Medical Center property.

B. Place excess excavated materials suitable for fill and/or backfill on site where directed.

C. Remove from site and dispose of any excess excavated materials after all fill and backfill operations have been completed.

D. Segregate all excavated contaminated soil designated by the Resident Engineer from all other excavated soils, and stockpile on site on two 0.15 mm (6 mil) polyethylene sheets with a polyethylene cover. A designated area shall be selected for this purpose. Dispose of excavated contaminated material in accordance with State and Local requirements.

3.7 CLEAN UP:

Upon completion of earthwork operations, clean areas within contract limits, remove tools, and equipment. Provide site clear, clean, free of debris, and suitable for subsequent construction operations. Remove all debris, rubbish, and excess material from Medical Center.

- - - END OF SECTION 02200 - - -

SECTION 02480

LANDSCAPING

PART 1 – GENERAL

1.1 DESCRIPTION

This work consists of furnishing and installing all planting materials required for landscaping hereinafter.

1.2 EQUIPMENT

Maintain all equipment, tools and machinery while on the project in sufficient quantities and capacity for proper execution of the work.

1.3 RELATED WORK

A. Section 01568, ENVIRONMENTAL PROTECTION.

1.4 SUBMITTALS

A. Certificates of Conformance or Compliance: Before delivery, notarized certificates attesting that the following materials meet the requirements specified shall be submitted to the Resident Engineer for approval:

1. Plant Materials (Department of Agriculture certification by State Nursery Inspector declaring material to be free from insects and disease).
2. Sod

1.5 DELIVERY AND STORAGE

A. Delivery:

1. Notify the Resident Engineer of the delivery schedule in advance so the plant material may be inspected upon arrival at the job site. Remove unacceptable plant material from the job site immediately.
2. Protect plants during delivery to prevent damage to root balls or desiccation of leaves. Protect trees during transport by tying in the branches and covering all exposed branches.
3. The use of equipment such as "tree spades" is permitted provided the plant balls are sized in accordance with ANSI Z60.1 and tops are protected from damage.
4. During delivery: Protect sod, from drying out and seed from contamination.

B. Storage:

1. Sprinkle sod with water and cover with moist burlap, straw or other approved covering, and protect from exposure to wind and

direct sunlight. Covering should permit air circulation to alleviate heat development.

2. Store plants not installed on the day of arrival at the site as follows:
   a. Shade and protect plants from the wind when stored outside.
   b. Protect plants stored on the project from drying out at all times by covering the balls or roots with moist sawdust, wood chips, shredded bark, peat moss, or other similar mulching material.
   d. Keep plants, including those in containers, in a moist condition until planted, by watering with fine mist spray.

1.6 PLANTING AND TURF INSTALLATION SEASONS AND CONDITIONS

A. No work shall be done when the ground is frozen, snow covered, too wet or in an otherwise unsuitable condition for planting. Special conditions may exist that warrants a variance in the specified planting dates or conditions. Submit a written request to the Resident Engineer stating the special conditions and proposal variance.

1.7 PLANT AND TURF ESTABLISHMENT PERIOD

A. The Establishment Period for plants and turf shall begin immediately after installation, with the approval of the Resident Engineer, and continue until the date that the Government accepts the project or phase for beneficial use and occupancy. During the Plant and Turf Establishment Period the Contractor shall:
   1. Water all plants and turf to maintain an adequate supply of moisture within the root zone. An adequate supply of moisture is the equivalent of 25 mm (1 inch) of absorbed water per week either through natural rainfall or augmented by periodic watering. Apply water at a moderate rate so as not to displace the mulch or flood the plants and turf.
   2. Prune plants as required.
   3. Replace and restore stakes, guy wires, and eroded plant saucers as required.
   4. In plant beds and saucers, remove grass, weeds, and other undesired vegetation, including the root growth, before they reach a height of 75 mm (3 inches).
   5. Provide the following turf establishment:
      a. Eradicate all weeds. Water, fertilize, overseed, and perform any other operation necessary to promote the growth of grass.

b. Replant areas void of turf 0.1 m^2 (one square foot) and larger in area.

c. Mow the new lawn at least three times prior to the final inspection. Begin mowing when grass is 100 mm (4 inches) high. Mow to a 65 mm (2-1/2 inch) height.

7. Remove plants that die during this period and replace each plant with one of the same size and species.

1.8 PLANT AND TURF WARRANTY

A. All work shall be in accordance with the terms of the Paragraph, "Warranty" of Section GENERAL CONDITIONS, including the following supplements:

B. A One Year Plant and Turf Warranty will begin on the date that the Government accepts the project or phase for beneficial use and occupancy. The Contractor shall have completed, located, and installed all plants and turf according to the plans and specifications. All plants and turf are expected to be living and in a healthy condition at the time of final inspection.

C. The Contractor will replace any dead plant material and any areas void of turf immediately. A one year warranty for the plants and turf that was replaced, will begin on the day the work is completed.

D. Replacement of relocated plants, that the Contractor did not supply, is not required unless they die from improper handling and care during transplanting. Loss through Contractor negligence requires replacement in kind and size.

E. The Government will re-inspect all plants and turf at the end of the One Year Warranty. The Contractor will replace any dead, missing, or defective plant material and turf immediately. The Warranty will end on the date of this inspection provided the Contractor has complied with the work required by this specification. The Contractor shall also comply with the following requirements:

1. Replace dead, missing or defective plant material prior to final inspection.
2. From plants having been installed for one year, remove stakes, guy wires and any required tree wrappings.
4. Complete remedial measures directed by the Resident Engineer to ensure plant and turf survival.
5. Repair damage caused while making plant or turf replacements.

1.9 APPLICABLE PUBLICATIONS

A. The publications listed below, form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.

B. American National Standards Institute (ANSI) Publications:

ANSI Z60.1-1996.....Nursery Stock

ANSI Z133.1-2000.....Tree Care Operations-Pruning, Trimming, Repairing, Maintaining, and Removing Trees and Cutting Brush- Safety Requirements

C. Hortus Third, A Concise Dictionary of Plants Cultivated in the U.S. and Canada, Wiley Publishers, 1976.

D. American Society For Testing And Materials (ASTM) Publications:

C136-05(Rev. A).....Sieve Analysis of Fine and Coarse Aggregates

C516-80(Rev. 2002).....Vermiculite Loose Fill Thermal Insulation

C549-81(Rev. 2002).....Perlite Loose Fill Insulation

D977-98(Rev. 2003).....Emulsified Asphalt (AASTHO M140 1988)

D2028-97(Rev. 2004).....Cutback Asphalt (Rapid-curing Type)

D2103-97(Rev. 2003).....Polyethylene Film and Sheeting

E. Turf Producers International:

Guideline Specifications to Turfgrass Sodding 1995 ed.

F. U. S. Department of Agriculture Federal Seed Act of August 9, 1939:

53 Stat. 1275.....Rules and Regulations

G. American Wood Preservative Association (AWPA):

C2-02.....Lumber, Timbers, Bridge Ties and Mine Ties, Pressure Treatment

PART 2 - PRODUCTS

2.1 GENERAL

All plant and turf material will conform to the varieties specified or shown in the plant list and be true to botanical name as listed in Hortus Third.

2.2 PLANTS

A. Plants shall be in accordance with ANSI Z60.1, except as otherwise stated in the specifications.

B. Provide well-branched and formed planting stock, sound, vigorous, and free from disease, sunscald, windburn, abrasion, harmful insects or insect eggs with healthy, normal, and unbroken root systems. Provide trees, Linden, that are single trunked with a single leader, unless otherwise indicated, display no weak crotches. Provide symmetrically developed deciduous trees and shrubs of uniform habit

of growth, with straight boles or stems and free from objectionable disfigurements. Plants shall have been grown under climatic conditions similar to those in the locality of the project. Spray all plants budding into leaf or having soft growth with an anti-desiccant at the nursery before digging.

C. The minimum acceptable sizes of all plants, measured before pruning with branches in normal position, shall be a 5” caliper. Plants larger in size than specified may be used with the approval of the Resident Engineer, with no change in the contract price. When larger plants are used, increase the ball of earth or spread of roots in accordance with ANSI Z60.1.

D. Provide nursery grown plant material conforming to the requirements and recommendations of ANSI Z60.1. Dig and prepare plants for shipment in a manner that will not cause damage to branches, shape, and future development after planting.

E. Balled and burlapped (B&B) plant ball sizes and ratios will conform to ANSI Z60.1, consisting of firm, natural balls of soil wrapped firmly with burlap or strong cloth and tied.

F. Bare-root (BR) plants shall have the root system substantially intact, but with the earth carefully removed. Cover roots with a thick coating of mud by "puddling" after the plants are dug.

G. Container grown plants shall have sufficient root growth to hold the earth intact when removed from containers, but shall not be root bound.

H. Make substitutions only when a plant (or its alternates as specified) is not obtainable and the Resident Engineer authorizes a change order providing for use of the nearest equivalent obtainable size or variety of plant having the same essential characteristics with an equitable adjustment of the contract price.

I. When existing plants are to be relocated, ball sizes shall conform to requirements for collected plants in ANSI Z60.1, and plants shall be dug, handled, and replanted in accordance with applicable sections of these specifications.

2.3 LABELS

Each plant, or group and bundles or containers of the same species, variety, and size of plant, shall be legibly tagged with a durable, waterproof and weather-resistant label indicating the correct plant name and size specified in the plant list. Labels shall be securely attached and not be removed.

2.4 TOPSOIL

A. Topsoil shall be a well-graded soil of good uniform quality. It shall be a natural, friable soil representative of productive soils in the vicinity. Topsoil shall be free of admixture of subsoil, foreign matter, objects larger than 25 mm (one inch) in any dimension, toxic substances, weeds and any material or substances that may be harmful to plant growth and shall have a pH value of not less than 5.0 nor more than 7.5.

B. Obtain material from stockpiles established under Section EARTHWORK, subparagraph, Stripping Topsoil, that meet the general requirements as stated above. Amend topsoil not meeting the pH range specified by the addition of pH Adjusters.

C. If sufficient topsoil is not available on the site to meet the depth as specified herein, the Contractor shall furnish additional topsoil. At least 10 days prior to topsoil delivery, notify the Resident Engineer of the source(s) from which topsoil is to be furnished. Obtain topsoil from well drained areas. Additional topsoil shall meet the general requirements as stated above and comply with the requirements specified in Section, TESTING. Amend topsoil not meeting the pH range specified by the addition of pH adjusters.

2.5 TURF FERTILIZER

Provide turf fertilizer that is commercial grade, free flowing, uniform in composition, and conforms to applicable state and federal regulations. Granular fertilizer shall bear the manufacturer's warranteed statement of analysis. Liquid starter fertilizer for use in the hydro seed slurry will be commercial type with 50 percent of the nitrogen in slow release form.

2.6 TREE WRAP

A. Tree wrap shall be secured to the trunk using bio-degradable tape suitable for nursery use and which is expected to degrade in sunlight in less than two years after installation

2.7 STAKES AND GUYING WIRES

A. Provide stakes for tree support of rough sawn wood, free from knots, rot, cross grain, or other defects that would impair the strength. Stakes shall be a minimum of 50 mm by 50 mm (2 inches by 2 inches), or 65 mm (2-1/2 inches) in diameter, by 2400 mm (8 feet) long and pointed at one end.

B. Guying wire shall be 2.7 mm (12 gage) annealed galvanized steel.

C. Hose chafing guards shall be new or used 2-ply reinforced rubber or plastic hose of all the same color on the project.

D. Flags to be fastened to guys shall be surveyor's plastic tape, white in color and 150 mm (6 inches) in length.

E. Guying cable shall be a minimum of five strand twisted, 5 mm (3/16 inch) diameter steel cable.

F. Turnbuckles shall be galvanized or cadmium plated and have a 75 mm (3 inch) minimum lengthwise opening fitted with screw eyes.

G. Eye bolts shall be galvanized or cadmium plated having a 50 mm (one inch) diameter eye with a minimum screw length of 40 mm (1-1/2 inches).

H. Deadmen shall be 100 mm by 200 mm (4 inch by 8 inch) rectangular, or 200 mm (8 inch) diameter by 900 mm (36 inch) long sound wood.

I. Arrow shaped or auger iron anchors shall be noncorrosive, and sized according to the manufacturer's recommendation.

2.8 WATER

Water shall not contain elements toxic to plant life. It shall be obtained as specified in Section, GENERAL REQUIREMENTS, paragraph, Temporary Services at no cost to the Contractor.

2.9 SOD

Sod shall be approved sod as classified in the TPI Guideline Specifications to Turfgrass Sodding. The composition of the grass species in the sod shall match existing.

2.10 HERBICIDES

All herbicides shall be properly labeled and registered with the U.S. Department of Agriculture. Keep all herbicides in the original labeled containers indicating the analysis and method of use.

PART 3 - EXECUTION

3.1 LAYOUT

Stake plant material locations and bed outlines on project site for approval by the Resident Engineer before any plant pits or beds are dug. The Resident Engineer may approve adjustments to plant material locations to meet field conditions.

3.2 EXCAVATION FOR PLANTING

A. Prior to excavating for plant pits and bed, verify the location of any underground utilities. Damage to utility lines will be repaired at the Contractor's expense. Where lawns have been established prior to planting operation, cover the surrounding turf before excavations are made in a manner that will protect turf areas. Barricade

existing trees, shrubbery, and beds that are to be preserved in a manner that will effectively protect them during the project construction.

B. Remove rocks and other underground obstructions to a depth necessary to permit proper planting according to plans and specifications. Where underground utilities, construction, or solid rock ledges are encountered, the Resident Engineer may select other locations for plant material.

C. Dig plant pits by any approved method so that they have vertical sides and flat bottoms. When pits are dug with an auger and the sides of the pits become glazed, scarify the glazed surface. Size the plant pits as shown, otherwise, the minimum allowable dimensions of plant pits shall be regardless of width, 150 mm (6 inches) deeper for shrubs and 225 mm (9 inches) deeper for trees than the depth of ball or root spread; for ball or root spread up to 600 mm (2 feet), pit diameters shall be twice the ball or root spread; for ball or root spread from 600 to 1200 mm (2 to 4 feet), pit diameters shall be 600 mm (2 feet) greater; for ball or root spread over 1200 mm (4 feet), pit diameters shall be 1-1/2 times the ball or root spread.

D. Where existing soil is to be used in place, till new ground cover and plant beds to a depth of 100 mm (4 inches) using a roto-tiller or similar type of equipment to obtain a uniform and well pulverized soil mix. During tillage operations, remove all sticks, stones, roots, and other objectionable materials. Bring plant beds to a smooth and even surface conforming to established grades.

F. In areas of new grading where existing soil is being replaced for the construction of new ground cover and plant beds, remove 100 mm (4 inches) of existing soil and replace with topsoil. Plant beds shall be brought to a smooth and even surface conforming to established grades.

G. Using topsoil, form earth saucers or water basins for watering around plants. Basins to be 2″ high for shrubs and 4″ high for trees.

H. Treat plant saucers, shrub, and ground cover bed areas, prior to mulching, with an approved pre-emergent herbicide. Plant ground cover in areas to receive erosion control material through the material after material is in place.

3.3 SETTING PLANTS

A. Handle balled and burlapped and container-grown plants only by the ball or container. Remove container-grown plants in such a way to prevent damage to plants or root system. Set plants plumb and hold in position until sufficient soil has been firmly placed around the roots or ball. Set plants so that the root crown is 1″ higher than the surrounding grade. Plant ground cover plants after the mulch is in place. Avoid contaminating the mulch with the planting soil. Add slow release packet, tablet or pellet fertilizer as each plant is installed as per manufacturer's recommendation for method of installation and quantity.

B. Backfill balled and burlapped and container-grown plants with planting soil mixture as specified to approximately half the depth of the ball and then tamp and water. For balled and burlapped plants, carefully remove excess burlap and tying materials and fold back. Where plastic wrap or treated burlap is used in lieu of burlap, completely remove these materials before backfilling. Tamp and water remainder of backfill Planting Soil Mixture; then form earth saucers or water basins around isolated plants with topsoil.

3.4 TRUNK WRAPPING

Wrap the trunks of deciduous trees immediately after planting. Wrap the trunks of deciduous trees, 40 mm (1-1/2 inches) or greater in caliber with the specified material beginning at the base and extending to the first branches. Remove wrapping after one year. When using Crinkled Paper Wrap, securely tie wrapping at the top and bottom and at 450 mm (18 inch) maximum intervals with twine.

3.5 STAKING AND GUYING

A. Stake and guy plants as specified.

B. Drive stakes vertically into the ground to a depth of 800 to 900 mm (2-1/2 to 3 feet) in such a manner as not to injure the ball or roots.

C. Place deadmen not less than 450 mm (18 inches) below the surface of the ground.

D. Install iron anchors according to manufacturer's recommendations.

E. Fasten flags securely on each guy wire approximately 2/3 of the distance up from ground level.

F. Remove stakes and guy wires after one year.

3.6 PRUNING

A. Prune new plant material in the following manner: Remove dead, broken and crossing branches. Prune deciduous trees and shrubs to reduce total amount of anticipated foliage by 1/4 to 1/3 while retaining typical growth habit of individual plants with as much height and spread as is practicable. Make cuts with sharp instruments as close as possible to the branch collar. Do not make flush cuts. Do not make "Headback" cuts at right angles to line of growth. Do not pole trees or remove the leader. Remove trimmings from the site. Paint cuts 13 mm (1/2 inch) in diameter and larger with the specified tree wound dressing.

B. Perform tree pruning and cavity work by in accordance with ANSI Z 133.1. Remove dead wood 13 mm (1/2 inch) or more in diameter, branches interfering with or hindering the healthy growth of the trees, and diseased branches with a clean cut made flush with the parent trunk. Cut back or remove branches as necessary to give the trees proper shape and balance. In removing large limbs, make the initial cut on the underside at a safe distance from the trunk or lateral, to prevent ripping of bark. Ensure branches and trimmings do not endanger traffic or cause damage to property during removal. Section large branches or limbs that cannot be removed in one piece without endangering traffic or property. Lower sections by ropes. Repair any damage resulting from the Contractor's negligence during pruning. Workmen are not permitted to climb trees with climbing spurs. To promote proper healing, cut off flush stubs or limbs that have resulted from improper cuts or broken as a result of former pruning. Remove girdling roots. Clean cuts or wounds measuring 13 mm (1/2 inches) or more in diameter, and exposed wood and scars resulting from previous work or damage. Remove decayed wood to expose healthy tissue. Shape cavities to provide drainage.

3.7 TILLAGE FOR TURF AREAS

Thoroughly till the soil to a depth of at least 100 mm (4 inches) by scarifying, disking, harrowing, or other approved methods. This is particularly important in areas where heavy equipment has been used, and especially under wet soil conditions. Remove all debris and stones larger than 25 mm (one inch) remaining on the surface after tillage in preparation for finish grading. To minimize erosion, do not till areas of 3:1 slope ratio or greater. Scarify these areas to a 50 mm (one inch) depth and remove debris and stones.

3.8 FINISH GRADING

After tilling the soil for bonding of topsoil with the subsoil, spread the topsoil evenly to a minimum depth of 50 to 75 mm (2 to 3 inches). Incorporate topsoil at least 50 to 75 mm (2 to 3 inches) into the subsoil to avoid soil layering. Do not spread topsoil when frozen or excessively wet or dry. Correct irregularities in finished surfaces to eliminate depressions. Protect finished topsoil areas from damage by vehicular or pedestrian traffic. Complete lawn work only after areas are brought to finished grade.

3.9 SODDING

A. Accomplish sodding in accordance with the ASPA Guideline Specifications for sodding. Lay sod at right angles to slope or the flow of water. On slope areas, start at the bottom of the slope.

B. After completing the sodding operation, blend the edges of the sodded area smoothly into the surrounding area.

3.10 WATERING

Apply water to the turf areas immediately following installation at a rate sufficient to ensure thorough wetting of the soil to a depth of at least 100 mm (4 inches). Supervise watering operation to prevent run-off. Supply all pumps, hoses, pipelines, and sprinkling equipment. Repair all areas damaged by water operations.

3.11 PROTECTION OF TURF AREAS

Immediately after installation of the turf areas, protect against traffic or other use by erecting barricades, as required, and placing approved signs at appropriate intervals until final acceptance.

3.12 EROSION CONTROL MATERIAL

A. Install and maintain erosion control material meeting the requirements of this specification on the designated areas as shown and specified. Prepare, fertilize and vegetate the area(s) to be covered, as specified, before the erosion material is placed. Immediately following the planting operations, lay the material evenly and smoothly and in contact with the soil throughout. Omit the straw mulch from all seeded areas receiving the erosion control material.

B. For waterways, unroll the material in the direction of waterflow. When two or more strips are required to cover a ditch area, they shall overlap at least 100 mm (4 inches). In case a strip is to be

spliced lengthwise, the ends of the strips shall overlap at least 150 mm (6 inches) with the upgrade section on top.

C. When using erosion control material on slopes, place the material either horizontally or vertically to the slope with the edges and ends of adjacent strips butted tightly against each other.

D. Staple each strip in three rows (each edge and center with the center row alternately spaced) with staples spaced not more than 1200 mm (4 feet) longitudinally. When using two or more strips side by side on slopes, use a common row of staples on the adjoining strips. Staple all end strips at 300 mm (one foot) intervals at the end. Firmly embed staples in the underlying soil.

E. Maintenance shall consist of repairs made necessary by erosion, wind, or any other cause. Maintain, protect, repair, or replace the erosion control material until the Termination of the Plant and Warranty Period.

3.13 RESTORATION AND CLEAN-UP

Where existing or new turf areas have been damaged or scarred during planting and construction operations, restore disturbed area to their original condition. Keep at least one paved pedestrian access route and one paved vehicular access route to each building clean at all times. In areas where planting and turf work have been completed, clear the area of all debris, spoil piles, and containers. Clear all other paved areas when work in adjacent areas is completed. Remove all debris, rubbish and excess material from the station.

3.14 ENVIRONMENTAL PROTECTION

All work and Contractor operations shall comply with the requirements of Section 01568, ENVIRONMENTAL PROTECTION.

- - - END OF SECTION 02480 - - -

SECTION 02513

ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.1 DESCRIPTION

A. The existing pavement will be milled and recycled through the asphalt batch plant. It is proposed that a 2″ layer of asphalt will be milled from the existing areas to be repaved and then a 2″ layer will be installed over all surfaces where milling has occurred.

B. This work shall cover the composition, mixing, construction upon the prepared subgrade, and the protection of hot asphalt concrete pavement. The hot asphalt concrete pavement shall consist of a base course and asphalt surface course constructed in conformity with the lines, grades, thickness, and cross sections as shown.

1.2 RELATED WORK

A. Laboratory and field testing requirements: Section 01410, TESTING LABORATORY SERVICES.

B. Subgrade Preparation: Section 02200, EARTHWORK.

1.3 INSPECTION OF PLANT AND EQUIPMENT

The Resident Engineer shall have access at all times to all parts of the material producing plants for checking the mixing operations and materials and the adequacy of the equipment in use.

1.4 ALIGNMENT AND GRADE CONTROL

The Registered Professional Land Surveyor or Registered Civil Engineer specified in Section, GENERAL REQUIREMENTS shall establish and control the pavement base course and asphalt surface course, alignments, grades, elevations, and cross sections as shown

1.5 SUBMITTALS

A. In accordance with Section 01340, SAMPLES AND SHOP DRAWINGS, furnish the following:

B. Data and Test Reports:

1. Asphalt Base and Surface Course: Aggregate source, gradation, soundness loss, percentage of wear, and other tests as required by the City of Omaha for city street construction.
2. Job-mix formula.

C. Certifications:

1. Asphalt prime and tack coat material certificate of conformance as required by the City of Omaha for city street construction.

2. Asphalt cement certificate as required by the City of Omaha for city street construction.
3. Contractor retaining and reimbursing a laboratory to perform said duties; or to obtain from the authorized representative of the City of Omaha a certification; or to obtain certification from the asphalt paving producer. Certificate of compliance shall cover quality and grades of asphaltic course materials, and that the job-mixture meets or exceeds the City of Omaha's requirements.
4. Job-mix certification - Submit plant mix certification that mix equals or exceeds the City of Omaha's road Specifications.

D. One copy of the City of Omaha's asphalt road specifications.

PART 2 - PRODUCTS

2.1 GENERAL

A. Asphaltic Surface Course: Asphaltic concrete surface course shall be in accordance with the standard specifications for City of Omaha streets and roads specifications. Asphalt prime coat and asphalt tack coat shall be as required by the City of Omaha streets and roads specifications. Specifications shall include amendments, addenda and errata. Asphalt prime coat and asphalt tack coat shall be as required by the City of Omaha streets and roads specifications. Where the term "Engineer" or "Commission" is referenced in the State Highway Specifications, it shall mean the VA Resident Engineer or VA Contracting Officer.

PART 3 - EXECUTION

3.1 INSTALLATION

The Asphalt Concrete Paving equipment, weather limitations, job-mix formula, mixing, construction methods, compaction, finishing, tolerance, and protection shall conform to the requirements of the appropriate sections of the City of Omaha's road and street paving specifications for the type of material specified. The asphalt surface course is to be a nominal 2" thickness.

3.2 SMOOTHNESS AND GRADE REQUIREMENTS

The surface course, upon completion of final rolling, shall be smooth, free of roller marks, and true to grade and cross section as shown. When tested with a 3 m (10 foot) straight edge, the surface shall not vary more than 5 mm (3/16 inch) in a longitudinal direction and not more than 6 mm (1/4 inch) in a traverse direction. No tolerances will be allowed which will pond water. Finished

surfaces at juncture with other pavements shall coincide with finished surfaces of abutting pavements.

3.3 FINISHED WORK SAMPLES AND PATCHING

The Contractor shall replace the pavement where a sample has been removed to the satisfaction of the Resident Engineer. Remove and patch any areas of completed pavement that are defective or damaged by subsequent construction, freezing, rainfall, or other weather conditions with approved base and asphalt mixtures laid in accordance with these specifications, at no additional cost to the Government.

3.4 PROTECTION OF PAVEMENT

After final rolling, no vehicular traffic of any kind shall be permitted on the pavement until pavement has cooled and hardened, and in no case, in less than six hours.

3.5 FINAL CLEAN-UP

Remove all debris, rubbish, and excess material from the Station.

- - - END OF SECTION 02513 - - -

SECTION 02514

SITE WORK CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION

A. This work shall cover site work concrete constructed upon the prepared subgrade and in conformance with the lines, grades, thickness, and cross sections as shown. Construction shall include the following:

B. combination curb and gutter.

C. Vehicular Pavement: Parking lot and driveways.

D. Pedestrian Pavement: Walks, wheelchair curb ramps. This specification identifies the basic requirements for fiber-reinforced concrete including material, labor, equipment, and services necessary to complete the work. Fiber-reinforced concrete is used to control cracking due to drying shrinkage and thermal expansion/contraction, reduction of permeability, increased impact capacity, shatter resistance, abrasion resistance, added fibrillated toughness and post crack residual strength.

1.2 RELATED WORK

A. Laboratory and Field Testing Requirements: Section 01410, TESTING LABORATORY SERVICES.

B. Subgrade Preparation: Section 02200, EARTHWORK.

1.3 WEATHER LIMITATIONS

Placement of concrete shall be as specified under paragraph 3.6, COLD WEATHER and HOT WEATHER.

1.4 SELECT SUBBASE MATERIAL JOB-MIX: NOT REQUIRED.

1.5 SUBMITTALS

A. In accordance with Section 01340, SAMPLES AND SHOP DRAWINGS, furnish the following:

B. Manufacturers' Certificates and Data certifying that the following materials conform to the requirements specified.

1. Expansion joint filler
2. Hot poured sealing compound
3. Reinforcement
4. Curing materials

C. Data and Test Reports: Select subbase material.

1. Job-mix formula

2. Source, gradation, liquid limit, plasticity index, percentage of wear, and other tests as specified and in referenced publications.

D. Fiber Reinforced Concrete: Appropriate data shall be submitted by the manufacturer to verify compliance of all physical and chemical properties, minimum length and quantity per C.Y.. The following submittals are required:

1. Manufacturer's printed product data to indicate proposed fiber-reinforced concrete materials including application rate per cubic yard of concrete.
2. Manufacturer's printed batching and mixing instructions.
3. A certificate prepared by the concrete supplier stating that the approved fibrous concrete reinforcement materials, at the minimum rate of 1.5 pounds per cubic yard were added to each batch of concrete delivered to the project site. Each certificate shall be accompanied by one (1) copy of each batch delivery ticket indicating the trade name, manufacturer's name, and amount per cubic yard, of fibrous concrete reinforcement material added to each batch of concrete.
4. A list of projects completed within the last three (3) years under the same trade name and manufacturer.
5. A list of projects with a satisfactory history of the reinforcing material with an experience period of no less than three (3) years under the same trade name and manufacturer.
6. Fiber manufacturer facility’s Certification of Registration.
7. Fiber reinforcement’s certification of performance meeting or exceeding ASTM C 1116.
8. Fiber reinforcement's certification of performance meeting or exceeding an average minimum residual strength of 50 psi, of 4 beams from a single batch, indicating the application rate used to meet criteria.

1.6 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only. Refer to the latest edition of all referenced Standards and codes.

B. American Association of State Highway and Transportation Officials (AASHTO):

M31.....Deformed and Plain Billet Steel Bars for Concrete Reinforcement (ASTM A615/A615M-96A)

M55M/55M.....Welded Steel Wire Fabric for Concrete Reinforcement (ASTM A185)

M147.....Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses (R 1996)

M148.....Liquid Membrane-Forming Compounds for Curing Concrete (ASTM C309A)

M171.....Sheet Materials for Curing Concrete (ASTM C171

M182.....Burlap Cloth Made from Jute or Kenaf

M213.....Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Type) (ASTM D1751)

T99.....Moisture-Density Relations of Soils Using a 2.5 kg. (5.5 lb) Rammer and a 305 mm (12 in.) Drop

C. American Society for Testing and Materials (ASTM):

C94/C94M.....Ready-Mixed Concrete

C143/C143M.....Slump of Hydraulic Cement Concrete

C1116……. Fiber-Reinforced Concrete

C1018……..Standard Test Method for Flexural Toughness and First-Crack Strength of Fiber-Reinforced Concrete

PART 2 - PRODUCTS

2.1 GENERAL

Concrete shall be Type C, air-entrained as specified in Section, CAST-IN-PLACE CONCRETE, with the following exceptions:

TYPE	MAXIMUM SLUMP*
Curb & Gutter	75 mm (3")
Pedestrian Pavement	75 mm (3")
Vehicular Pavement	50 mm (2") (Machine Finished)
	100 mm (4") (Hand Finished)

* For concrete to be vibrated: Slump as determined by ASTM C143. Tolerances as established by ASTM C94.

2.2 FRC PERFORMACE REQUIREMENTS:

Fiber-reinforced concrete materials shall produce concrete conforming to the requirements for each type and class of concrete required and shall conform to ASTM C 94, ASTM C 1116, Type III and ASTM C 1018. Quantity shall be used at a minimum rate of 1.5 lbs. per C.Y.

2.3 REINFORCEMENT

The type, amount, and locations of steel reinforcement shall be as shown and specified. Welded wire-fabric shall conform to AASHTO M55. Dowels shall be plain steel bars conforming to AASHTO M31 or M42. Tie bars shall be deformed steel bars conforming to AASHTO M31 or M42.

2.4 CRUSHED STONE OR GRAVEL FILL

Fill to be placed under concrete equipment pads on grade shall be graded from 25 mm (one inch) to No. 4, tamped and leveled. The thickness shall be 150 mm (6 inches) unless otherwise indicated.

2.5 SELECT SUBBASE

Subbase material shall consist of selected granular material composed of sand, sand-gravel, crushed stone, crushed or granulated slag, with or without soil binder, or combinations of these materials conforming to AASHTO M147, Grading E or F. Materials meeting other gradations than that noted, will be acceptable whenever the gradations are within a tolerance of three to five percent, plus or minus, of the single gradation established by the job-mix formula. Subbase material shall produce a compacted, dense-graded course meeting the density requirement herein specified.

2.6 FORMS

Use metal or wood forms that are straight and suitable for the work involved in cross-section, depth, and strength to resist springing during depositing and consolidating the concrete. Wood forms should be at lease 50 mm (2 inches) thick. Do not use forms if they vary from a straight line more than 3 mm (1/8 inch) in any 3000 mm (ten foot) long section in either a horizontal or vertical direction. Wood forms shall also be free from warp, twist, loose knots, splits, or other defects. Use approved flexible or curved forms for radius forming.

2.7 CONCRETE CURING MATERIALS

A. Concrete curing materials shall conform to one of the following:

B. Burlap conforming to AASHTO M182 having a weight of 200 grams (seven ounces) or more per square meter (yard) when dry.

C. Impervious Sheeting conforming to AASHTO M171.

D. Liquid Membrane Curing Compound conforming to AASHTO M148, Type 2, and shall be free of paraffin or petroleum. Use white pigmented only.

2.8 EXPANSION JOINT FILLERS

Material shall conform to AASHTO M213.

2.9 JOINT SEALER

Material shall conform to AASHTO M173.

PART 3 - EXECUTION

3.1 SUBGRADE PENETRATION

Prepare, construct, and finish the subgrade as specified in Section, 02200 3.1D EARTHWORK. Test the complete subgrade for grade and cross section with a template. Maintain the subgrade in a smooth, compacted condition, in conformance with the required section and established grade until the succeeding operation has been accomplished.

3.2 SELECT SUBBASE

A. Mixing: Proportion the select subbase by weight or by volume in quantities so that the final approved job-mixed formula gradation, liquid limit, and plasticity index requirements will be met after subbase course has been placed and compacted. Add water in approved quantities, measured by weight or volume, in such a manner to produce a uniform blend.

B. Placing: Place the mixed material on the prepared subgrade in a uniform layer to the required contour and grades, and to a loose depth not to exceed 200 mm (8 inches), that when compacted, will produce a layer of the designated thickness. When the designated compacted thickness exceeds 150 mm (6 inches), place the material in layers of equal thickness. Remove unsatisfactory areas and replace with satisfactory mixture, or mix the material in the area. In no case will the addition of thin layers of material be added to the top layer in order to meet grade. If the elevation of the top layer is 13 mm (1/2 inch) or more below the grade, excavate the top layer and replace with new material to a depth of at least 75 mm (3 inches) in compacted thickness.

C. Compaction: Perform compaction with approved equipment (hand or mechanical) well suited to the material being compacted. Moisten or

aerate the material as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used. Compact each layer to at least 95 percent or 100 percent of maximum density as determined by AASHTO T180 or AASHTO T99 respectively.

D. Smoothness Test and Thickness Control: Test the completed subbase for grade and cross section with a straight edge. The surface of each layer shall not show any deviations in excess of 10 mm (3/8 inch). The completed thickness shall be within 13 mm (1/2 inch) of the thickness as shown.

E. Protection: Maintain the finished subbase in a smooth and compacted condition until the concrete has been placed. When Contractor's subsequent operations or adverse weather disturbs the approved compacted subbase, excavate, and reconstruct it with new material meeting the requirements herein specified, at no additional cost to the Government.

3.3 SETTING FORMS

A. Base Support: Compact the foundation under the forms true to grade so that, when set, they will be uniformly supported for its entire length at the grade as shown. Correct imperfections or variations in the foundation grade by cutting or filling and compacting.

B. Form Setting: Set forms sufficiently in advance of the placing of the concrete to permit the performance and approval of all operations required with and adjacent to the form lines. Set forms to true line and grade and use stakes, clamps, spreaders, and braces to hold them rigidly in place so that the forms and joints are free from play or movement in any direction. Forms shall conform to line and grade with an allowable tolerance of 3 mm (1/8 inch) when checked with a straightedge and shall not deviate from true line by more than 6 mm (1/4 inch) at any point. Do not remove forms until removal will not result in damaged concrete or at such time to facilitate finishing. Clean and oil forms each time they are used.

3.4 EQUIPMENT

The Resident Engineer shall approve equipment and tools necessary for handling materials and performing all parts of the work prior to commencement of work. Maintain equipment and tools in satisfactory working condition at all times.

3.5 PLACING REINFORCEMENT

Reinforcement shall be free from dirt, oil, rust, scale or other substances that prevent the bonding of the concrete to the reinforcement. Do not place reinforcement within 50 mm (2 inches) of an exposed surface. The type, amount, and position of the reinforcement shall be as shown.

3.6 PLACING CONCRETE - GENERAL

Remove debris and other foreign material from between the forms before placing concrete. Obtain approval of the Resident Engineer before placing concrete. Before the concrete is placed, uniformly moisten the base, avoiding puddles of water. Convey concrete from mixer to final place of deposit by a method which will prevent segregation or loss of ingredients. Deposit concrete so that it requires as little handling as possible. Over-vibration or manipulation causing segregation will not be permitted. Place concrete continuously between joints without bulkheads. Install a construction joint whenever the placing of concrete is suspended for more than 30 minutes and at the end of each day's work. Workmen or construction equipment coated with foreign material shall not be permitted to walk or operate in the concrete during placement and finishing operations.

A. HOT WEATHER:

Follow the recommendations of ACI 305 or as specified to prevent problems in the manufacturing, placing, and curing of concrete that can adversely affect the properties and serviceability of the hardened concrete. Methods proposed for cooling materials and arrangements for protecting concrete shall be made in advance of concrete placement and approved by Resident Engineer.

B. COLD WEATHER:

Follow the recommendations of ACI 306 or as specified to prevent freezing of concrete and to permit concrete to gain strength properly. Use only the specified non-corrosive, non-chloride accelerator. Do not use calcium chloride, thiocyantes or admixtures containing more than 0.05 percent chloride ions. Methods proposed for heating materials and arrangements for protecting concrete shall be made in advance of concrete placement and approved by Resident Engineer.

3.7 PLACING CONCRETE FOR PEDESTRIAN PAVEMENT.

Place fiber reinforced concrete (FRC) in the forms in one layer to a minimum of 5″ thickness, when compacted and finished. Fiber-reinforced concrete shall be added directly to the concrete at the time of batching in amounts in accord with approved submittals for each type of concrete required. Mix concrete in strict accord with fiber-reinforced concrete manufacturer, instructions and recommendations. Deposit FRC as near to joints as possible without disturbing them but do not dump onto a joint assembly. After the FRC has been placed in the forms, use a strike-off guided by the side forms to bring the surface to the proper section to be compacted. Consolidate the concrete thoroughly by tamping and spading, or with approved mechanical finishing equipment. Finish the surface to grade with a wood or metal float.

3.8 PLACING CONCRETE FOR CURBS.

Place concrete in the forms in one layer to a minimum of 5″ thickness, when compacted and finished. Deposit concrete as near to joints as possible without disturbing them but do not dump onto a joint assembly. After the concrete has been placed in the forms, use a strike-off guided by the side forms to bring the surface to the proper section to be compacted. Consolidate the concrete thoroughly by tamping and spading, or with approved mechanical finishing equipment. Finish the surface to grade with a wood or metal float.

3.9 PLACING CONCRETE FOR VEHICULAR PAVEMENT

Deposit concrete into the forms as close as possible to its final position. Place concrete rapidly and continuously between construction joints. Strike off concrete and thoroughly consolidate by a finishing machine, vibrating screed, or by hand-finishing. Finish the surface to the exact elevation and crown as shown. When the forward motion of the vibrating screed is stopped, shut off the vibrator. Deposit concrete as near the joints as possible without disturbing them but do not dump onto a joint assembly. Do not place adjacent lanes without approval by the Resident Engineer.

3.10 CONCRETE FINISHING - GENERAL

Start finishing operations immediately after placement of the concrete. Use machine method or the hand method for finishing. The sequence of operations, unless otherwise indicated, shall be as follows: Consolidating, floating, straightedging, troweling,

texturing, and edging of joints. Maintain finishing equipment and tools in a clean and approved condition.

3.11 CONCRETE FINISHING CURB AND GUTTER

Round the edges of the gutter and top of the curb with an edging tool to a radius of 6 mm (1/4 inch) or as otherwise detailed. Float the surfaces and finish with a smooth wood or metal float until true to grade and section and uniform in textures. Finish the surfaces, while still wet, with a bristle type brush with longitudinal strokes. Immediately after removing the front curb form, rub the face of the curb with a wood or concrete rubbing block and water until blemishes, form marks, and tool marks have been removed. Brush the surface, while still wet, in the same manner as the gutter and curb top. Except at grade changes or curves, finished surfaces shall not vary more than 3 mm (1/8 inch) for gutter and 6 mm (1/4 inch) for top and face of curb, when tested with a 3000 mm (10 foot) straightedge,. Remove and reconstruct irregularities exceeding the above for the full length between regularly scheduled joints. Correct any depressions which will not drain. Visible surfaces and edges of finished combination curb and gutter shall be free of blemishes, form marks, and tool marks, and shall be uniform in color, shape, and appearance.

3.12 CONCRETE FINISHING PEDESTRIAN PAVEMENT

A. Walks and Wheelchair Curb Ramps: Finish the surfaces to grade and cross section with a metal float, trowled smooth and finished with a broom moistened with clear water. Brooming shall be transverse to the line of traffic. Finish all slab edges, including those at formed joints, carefully with an edger having a radius of 3 mm (1/8 inch). Unless otherwise indicated, edge the transverse joints before brooming. The brooming shall eliminate the flat surface left by the surface face of the edger. Execute the brooming so that the corrugation, thus produced, will be uniform in appearance and not more than 2 mm (1/16 inch) in depth. The completed surface shall be uniform in color and free of surface blemishes, form marks, and tool marks. The finished surface of the pavement shall not vary more than 5 mm (3/16 inch) when tested with a 3000 mm (10 foot) straightedge. The thickness of the pavement shall not vary more than 6 mm (1/4 inch). Remove and reconstruct irregularities exceeding the above for the full length between regularly scheduled joints.

3.13 CONCRETE FINISHING VEHICULAR PAVEMENT

Use either machine or hand methods for finishing. Accomplish longitudinal floating with a longitudinal float not less than 3000 mm (10 feet) long and 150 mm (6 inches) wide, properly stiffened to prevent flexing and warping. Operate the float from foot bridges in a sawing motion parallel to the direction in which the pavement is being laid from one side of the pavement to the other and advancing not more than half the length of the float. After the longitudinal floating is completed, but while the concrete is still plastic, eliminate minor regularities in the pavement surfaces by means of metal floats, 1500 mm (5 feet) in length, and straightedges, 3000 mm (10 feet) in length. Use the floating to smooth and fill open textured areas in the pavement surfaces, but minimize their use. Make the final finish with the straightedges which shall be used to float the entire pavement surface. Test the surface for trueness with a 3000 mm (10 foot) straightedge held in successive positions parallel and at right angles to the direction in which the pavement is being laid and the entire area covered as necessary to detect variations. Advance the straightedge along the pavement in successive stages of not more than one half the length of the straightedge. Correct all irregularities and refinish the surface. The finished surface of the pavement shall not vary more than 6 mm (1/4 inch) in both longitudinal and transverse directions when tested with a 3000 mm (10 foot) straightedge. The thickness of the pavement shall not vary more than 6 mm (1/4 inch). When most of the water glaze or sheen has disappeared and before the concrete becomes nonplastic, give the surface of the pavement a broomed finish with an approved fiber broom not less than 450 mm (18 inches) wide. Pull the broom gently over the surface of the pavement from edge to edge. Slightly overlap adjacent strokes. Brooming shall be transverse to the line of traffic and so executed that the corrugations thus produced will be uniform in character and width, and not more than 3 mm (1/8 inch) in depth. Carefully finish the edge of the pavement along forms and at the joints with an edging tool. The brooming shall eliminate the flat surface left by the surface face of the edger. The finish surfaces of new and existing abutting pavements shall coincide at their juncture.

3.14 CONCRETE FINISHING EQUIPMENT PADS

After the surface has been struck off and screeded to the proper elevation, give it a smooth dense float finish, free from depressions or irregularities. Carefully finish all slab edges with an edger having a radius of 25 mm (one inch) or as shown. After removing the forms, rub the faces of the pad with a wood or concrete rubbing block and water until blemishes, form marks, and tool marks have been removed. The finish surface of the pad shall not vary more than 3 mm (1/8 inch) when tested with a 3000 mm (10 foot) straightedge. Correct irregularities exceeding the above.

3.15 JOINTS - GENERAL

Place joints, where shown, conforming to the details as shown, and perpendicular to the finished grade of the concrete surface..

3.16 CONTRACTION JOINTS

Cut joints to depth as shown with a grooving tool or jointer of a radius as shown or by sawing with a blade producing the required width and depth. Construct joints in curbs and gutters by inserting a trowel into the fresh concrete to a min. of 4”. Finish edges of all joints with an edging tool having the radius as shown. Score pedestrian pavement with a standard grooving tool or jointer.

3.17 EXPANSION JOINTS

Use a preformed expansion joint filler material of the thickness as shown to form expansion joints. Material shall be full depth of concrete, cut and shaped to the cross section as shown, except that top edges of joint filler shall be below the finished concrete surface where shown to allow for sealing. Anchor with approved devices to prevent displacing during placing and finishing operations. Round the edges of joints with an edging tool. Form expansion joints without dowels about structures and features that project through, into, or against any site work concrete construction, using joint filler of the type, thickness, and width as shown, and installed in such a manner as to form a complete, uniform separation between the structure and the site work concrete item.

3.18 CONSTRUCTION JOINTS

Locate longitudinal and transverse construction joints between slabs of vehicular pavement as shown. Place transverse construction joints of the type shown, where indicated and whenever the placing of concrete is suspended for more than 30 minutes. Use a butt-type

joint with dowels in curb and gutter if the joint occurs at the location of a planned joint. Use keyed joints with tiebars if the joint occurs in the middle third of the normal curb and gutter joint interval. In forming construction joints, carefully form a definite groove at the top, to the depth and width shown, to provide a recess for joint sealing material and to prevent any overhang onto concrete already in place. Install keyed joints and reinforcement as shown.

3.19 FORM REMOVAL

Forms shall remain in place at least 12 hours after the concrete has been placed. Remove forms without injuring the concrete. Do not use bars or heavy tools against the concrete in removing the forms. Promptly repair any concrete found defective after form removal.

3.20 SEALING JOINTS

At the end of the curing, carefully clean and fill joints with joint sealer as shown. The concrete at the joint shall be surface dry and the ambient temperature shall be above 10□C (50□F) at the time of application. The joint sealer shall not spill over the joint onto adjacent surface. Refill joints where necessary before final acceptance. Do not seal joints of pedestrian pavement.

3.21 CURING OF CONCRETE

A. Cure concrete by one of the following methods appropriate to the weather conditions and local construction practices, against loss of moisture, and rapid temperature changes for at least seven days from the beginning of the curing operation. Protect unhardened concrete from rain and flowing water. All equipment needed for adequate curing and protection of the concrete shall be on hand and ready to install before actual concrete placement begins. Provide protection as necessary to prevent cracking of the pavement due to temperature changes during the curing period. If any selected method of curing does not afford the proper curing and protection against concrete cracking, remove and replace the damaged pavement and employ another method of curing as directed by the Resident Engineer.

B. Burlap Mat: Provide a minimum of two layers kept saturated with water for the curing period. Mats shall overlap each other at least 150 mm (6 inches).

C. Impervious Sheeting: Use waterproof paper, polyethylene-coated burlap, or polyethylene sheeting. Polyethylene shall be at lease 0.1 mm (4 mils) in thickness. Wet the entire exposed concrete surface with a fine spray of water and then cover with the sheeting

material. Sheets shall overlap each other at least 300 mm (12 inches). Securely anchor sheeting.

D. Liquid Membrane Curing: Apply white pigmented membrane-forming curing compound in two coats at right angles to each other at a rate of 5 m^2/L (200 square feet per gallon) for both coats. Do not allow the concrete to dry before the application of the membrane. Cure joints designated to be sealed by inserting moistened paper or fiber rope or covering with waterproof paper prior to application of the curing compound, in a manner to prevent the curing compound entering the joint. Immediately respray any area covered with curing compound and damaged during the curing period.

3.22 CLEANING

After completion of the curing period, remove the curing material (other than liquid membrane), sweep the concrete clean, and, after removal of all foreign matter from the joints, seal joints as herein specified. Clean the entire concrete of all debris and construction equipment as soon as curing and sealing of joints has been completed.

3.23 PROTECTION

The contractor shall protect the concrete against all damage prior to final acceptance by the Government. Remove concrete containing excessive cracking, fractures, spalling, or other defects and reconstruct the entire section between regularly scheduled joints, when directed by the Resident Engineer, and at no additional cost to the Government. Exclude traffic from vehicular pavement until the concrete is at least seven days old, or for a longer period of time if so directed by the Resident Engineer.

3.24 FINAL CLEAN-UP

Remove all debris, rubbish and excess material from the Station.

- - - END OF SECTION 02514 - - -

SECTION 02577

PAVEMENT MARKING

PART 1 - GENERAL

1.1 DESCRIPTION

This work shall consist of furnishing and applying paint on pavement surfaces, in the form of traffic lanes, parking bays, areas restricted to handicapped persons, crosswalks, and other detail pavement markings, in accordance with the details as shown or as prescribed by the Resident Engineer. Conform to the Manual on Uniform Traffic Control Devices for Streets and Highways, published by the U.S. Department of Transportation, Federal Highway Administration, for details not shown.

1.2 SUBMITTALS

A. In accordance with Section 01340, SAMPLES AND SHOP DRAWINGS, furnish Manufacturer's Certificates and Data certifying that the following materials conform to the requirements specified.

B. Paint

1.3 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. Federal Specifications (Fed. Spec.):

TT-B-1325C.....Beads (Glass Spheres); Retro-Reflective

TT-P-1952D.....Paint, Traffic Black, and Airfield Marking, Waterborne

C. Master Painters Institute (MPI):

No. 97-2002.....Latex Traffic Marking Paint

PART 2 - PRODUCTS

2.1 PAINT

Paint for marking pavement (parking lot and zone marking) shall conform to MPI No. 97, color as shown. Paint for obliterating existing markings shall conform to Fed. Spec. TT-P-1952D. Paint shall be in containers of at least 18 L (5 gallons). A certificate shall accompany each batch of paint stating compliance with the applicable publication.

2.2 PAINT APPLICATOR

Apply all marking by approved mechanical equipment. The equipment shall provide constant agitation of paint and travel at controlled

speeds. Synchronize one or more paint "guns" to automatically begin and cut off paint flow in the case of skip lines. The equipment shall have manual control to apply continuous lines of varying length and marking widths as shown. Provide pneumatic spray guns for hand application of paint in areas where a mobile paint applicator cannot be used. An experienced technician that is thoroughly familiar with equipment, materials, and marking layouts shall control all painting equipment and operations.

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2.4 SANDBLASTING EQUIPMENT

Sandblasting equipment shall include an air compressor, hoses, and nozzles of proper size and capacity as required for cleaning surfaces to be painted. The compressor shall furnish not less than 150 cfm of air at a pressure of not less than 90 psi at each nozzle used.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of marking materials.

B. Thoroughly clean all surfaces to be marked before application of paint. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods. Completely remove rubber deposits, existing paint markings, and other coatings adhering to the pavement with scrapers, wire brushings, sandblasting, mechanical abrasion, or approved chemicals as directed by the Resident Engineer. The application of paint conforming to Fed. Spec. TT-P-110 is an option to removal of existing paint markings on asphalt pavement. Apply the black paint in as many coats as necessary to completely obliterate

the existing markings. Where oil or grease are present on old pavements to be marked, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application. After cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through the new paint. Pavement marking shall follow as closely as practicable after the surface has been cleaned and dried, but do not begin any marking until the Resident Engineer has inspected the surface and gives permission to proceed. The Contractor shall establish control points for marking and provide templates to control paint application by type and color at necessary intervals. The Contractor is responsible to preserve and apply marking in conformance with the established control points.

3.2 APPLICATION

Apply uniformly painted pavement marking of required color(s), length, and width with true, sharp edges and ends on properly cured, prepared, and dried surfaces in conformance with the details as shown and established control points. The length and width of lines shall conform within a tolerance of plus or minus inches and plus or minus 1/8 inch, respectively, in the case of skip markings. The length of intervals shall not exceed the line length tolerance. Temperature of the surface to be painted and the atmosphere shall be above 50□F and less than 95□F. Apply the paint at a wet film thickness of 0.015 inch. Apply paint in one coat. At the direction of the Resident Engineer, markings showing light spots may receive additional coats. The maximum drying time requirements of the paint specifications will be strictly enforced, to prevent undue softening of asphalt, and pick-up, displacement, or discoloration by tires of traffic. If there is a deficiency in drying of the marking, discontinue paint operations until cause of the slow drying is determined and corrected. Remove and replace marking that is applied at less than minimum material rates; deviates from true alignment; exceeds stipulated length and width tolerances; or shows light spots, smears, or other deficiencies or irregularities. Use carefully controlled sand blasting, approved grinding equipment, or other approved method to remove marking so that the surface to which the marking was applied will not be damaged.

3.3 PROTECTION

Conduct operations in such a manner that necessary traffic can move without hindrance. Protect the newly painted markings so that, insofar as possible, the tires of passing vehicles will not pick up paint. Place warning signs at the beginning of the wet line, and at points well in advance of the marking equipment for alerting approaching traffic from both directions. Place small flags or other similarly effective small objects near freshly applied markings at frequent intervals to reduce crossing by traffic. Efface and replace damaged portions of markings at no additional cost to the Government.

3.4 DETAIL PAVEMENT MARKING

Use Detail Pavement Markings, exclusive of actual traffic lane marking, at exit and entrance islands and turnouts, on curbs, at crosswalks, at parking bays, and at such other locations as shown. Show the International Handicapped Symbol at indicated parking spaces. Color shall be as shown. Apply paint for the symbol using a suitable template that will provide a pavement marking with true, sharp edges and ends. Place detail pavement markings of the color(s), width(s) and length(s), and design pattern at the locations shown.

3.5 FINAL CLEAN-UP

Remove all debris, rubbish and excess material from the Station.

- - - END OF SECTION 02577 - - -

- - - - - END OF SPECIFICATIONS - - - - -